DEPRESSION IN ADOLESCENTS WITH ATTENTION

DEFICIT HYPERACTIVITY DISORDER: USING

CONDITIONAL PROBABILITIES BASED

ON TEACHER RATINGS FROM THE

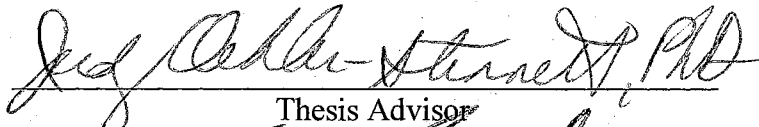BEHAVIOR ASSESSMENT

SYSTEM FOR CHILDREN

BY

NANCY FAYE BARTON

Bachelor of Science
University of Tulsa
Tulsa, Oklahoma
1971

Master of Education
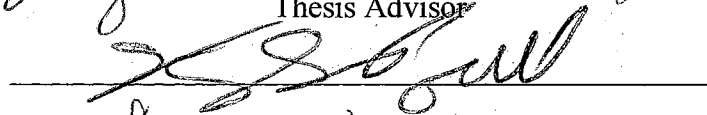Northeastern State University
Tahlequah, Oklahoma
1974

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
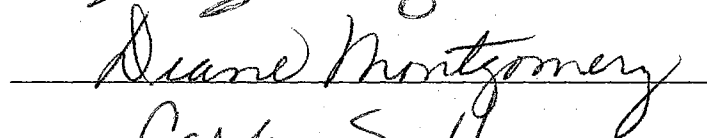the Degree of
DOCTOR OF PHILOSOPHY
May, 1999

DEPRESSION IN ADOLESCENTS WITH ATTENTION

DEFICIT HYPERACTIVITY DISORDER: USING

CONDITIONAL PROBABILITIES BASED

ON TEACHER RATINGS FROM THE

BEHAVIOR ASSESSMENT

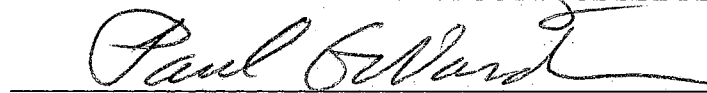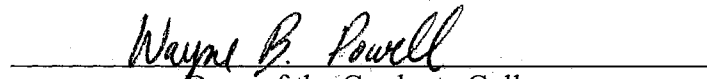SYSTEM FOR CHILDREN

Thesis Approved:

_____
Thesis Advisor

_____

_____

_____

_____

_____
Dean of the Graduate College

ii

ACKNOWLEDGMENTS

I wish to express my sincere appreciation to my husband, Bruce, and my daughter, Page, for their encouragement during difficult times and their love and understanding throughout this whole process. To my parents, Richard and Vickie Coleman, I want to thank them for teaching me how to believe in myself.

A special thank you to Dr. Judy Oehler-Stinnett, my dissertation chairperson, for her patience and persistence as she directed me through this process. To Dr. Kay Bull, my chairperson, I am appreciative of his positive attitude and continual support. To Dr. Paul Warden, a committee member, I am thankful for his ability to inspire me to go into the program eight years ago. Thank you also to Dr. Diane Montgomery and Dr. Carolyn Henry who gave me support and were positive female role models to emulate.

I want to thank Jenks Public Schools for their willingness to let me conduct my research with their parents, students, and teachers. Without their cooperation, this study would not have been possible. Finally, this study is dedicated to Vickie Scarbrough, a former school psychologist at Jenks Public Schools. Vickie always looked at the strengths and possibilities within a child, was kind and gentle with parents, and was a loyal and endearing friend to everyone she knew.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

School psychologists are charged with the responsibility of assessing and

differentiating students with disorders/disabilities and then assisting multidisciplinary

educational teams in making decisions regarding students' appropriate academic

programming and related services. This responsibility, although great, is not problematic

when the disorders/disabilities are pure and specifically defined, i.e., visual impairment,

and hearing impairment. However, when considering the condition of Attention Deficit

Hyperactivity Disorder (ADHD), the responsibility has been confusing because of the

classification system used and difficult because of misdiagnosis by physicians and the

condition of comorbidity. This confusion and difficulty has become more apparent

recently because of the increased numbers of students identified as ADHD (Diller, 1996).

Diller (1996) has suggested the increase in ADHD is partly due to the

classification system most often used in the United States, the American Psychiatric

Association Diagnostic Statistical Manual of Mental Disorders (DSM-II, 1968; DSM-III,

1980; DSM-III-R, 1987; DSM-IV, 1994) which identifies criteria/symptoms that define

disorders. One is considered to have a disorder if the requisite number of criteria are

present for a specified period of time, the criteria are within certain environments, and in

some instances the criteria occur in clusters or subtypes. Initially, Attention Deficit

Disorder (ADA) was called "hyperkinetic reaction of childhood" in DSM-II (1968). To

qualify for this condition, one demonstrated maladaptive levels of inattention, impulsivity, and motor hyperactivity. The DSM-III (1980) separated the condition and identified two types of youth with ADD. Those who had maladaptive levels of inattention, impulsivity, and motor activity were one type and the second type were those with normal ranges of motor activity but maladaptive functions in the areas of inattention and impulsivity. With the publication of DSM-III-R (1987), the name changed from ADD to ADHD, and the condition again became just one type. An attempt was made to have a category of undifferentiated ADD, which would address those who did not have the hyperactivity, but it was presented in such vague and tentative terms it was not effective. The change from a three-dimensional to a one-dimensional definition sparked controversy and began new research to determine the underlying dimensions of ADHD. The DSM-IV (1994) task force used research to formulate new criteria, which has again separated the conditions into two subtypes; however, the breakdown is different from that of DSM-III (1980) in that one type is inattention and the other type is a combination of hyperactivity and impulsivity (Lahey et al., 1994). These changes in the classification system make it increasingly difficult to identify consistently children having the disorder.

Another explanation for the increase in the number of identified students with ADHD suggests children are being misdiagnosed because of the pressure physicians feel by managed care to find simple solutions to complex problems. These economic constraints make it more attractive to medicate a child to control their behavior, rather than deal with the more difficult issues of emotions, family relationships, or the school environment (Accardo, Blondis, & Whitman, 1990; Diller, 1996; Weinberg & Emslie, 1991). The physician identifies the acting out behavior, labels it as hyperactivity and does not take the time to generate any other hypotheses regarding the condition. This may be

because they are more familiar with ADHD, or the stimulant medication they prescribe lessens the hyperactivity, which leads them to believe their diagnosis was correct (Diller, 1996).

In addition to the classification system difficulties and misdiagnoses, the condition of comorbidity plays a role in the increase of ADHD numbers. Comorbidity, first identified by Feinstein in 1970, refers to the fact that two disorders occur together. The condition affects research and clinical practice as a result of its influence on diagnosis, prognosis, treatment, and the health care system. Comorbidity may affect the course of the first disorder and create more severe and longer episodes for both disorders. Although the empirical knowledge of comorbidity in adults has increased in the literature, the information about adolescents and comorbidity is limited (Lewinsohn, Rohde, Seeley, & Hops, 1991).

Comorbidity makes it difficult to determine which disorder is primary and which is secondary. It confuses assessment and diagnostic procedures and requires a more complicated treatment plan. Although one might think it is logical to treat the primary disorder first, that treatment may increase the symptoms in the second disorder (Lewinsohn et al., 1991). Whether a comorbid disorder precedes or follows another disorder may explain an etiological trigger or a residual stage for other disorders (Lewinsohn et al., 1991). Comorbidity does not appear to be exclusive to one region or culture, rather it has been found in diverse epidemiological samples (i.e. New Zealand and Puerto Rico) as well as clinic samples (Biederman, Newcorn, & Sprich, 1991).

The literature supports the comorbidity of ADHD with conduct disorders, anxiety disorders, and learning disorders (Barrickman et al., 1995; Biederman et al., 1991; Kashani et al., 1987; Weinberg et al., 1989). Less is known about the relationship

between ADHD and depression because prior to the 1970's, it was believed that the behavioral features associated with depression were typical aspects of the developmental process, and that depression as known to adults was a rare occurrence in children (Cullinan, Schloss, & Epstein, 1987). During the 1960's and early 70's an attempt was made to explain the comorbidity of depression by proposing a tripariate classification of childhood neurotic depression as acute, chronic, or masked (Cytryn & McKnew, 1972). It was suggested that children could be differentiated as to their type of depression by looking at their family histories, their premorbid adjustment, and their personalities. Specifically, the masked depression concept represented an attempt to encompass the possibility that types of depression might have different presentations and psycho-pathological correlates at different ages and to provide a theoretical framework for understanding comorbidity. As time passed, this explanation received less support because the concept of masked depression began to be associated with almost any childhood disorder. In addition, in order to suggest masked depression, it was thought that some symptoms of depression had to be observed, in which case the depression could not be considered masked (Kovacs & Beck, 1977). Thus, the real issue was not one of masking but the "association of unhappiness with a wide range of disorders, and the problem was to identify specific depressive disorders from this poorly differentiated morass" (Angold, 1988). Finally with the publication of the DSM-III (1980), depression in children/adolescents was codified and recognized as a disorder in children/adolescents (Allen-Meares, 1987). Since then substantial increases in the prevalence of child/adolescent depression and a decrease in the age of onset have been reported. In addition, residual effects of depression are being found in children and adolescents who recover from depression (Jensen et al., 1993). Ryan et al. (1987) investigated the clinical

picture of major depression in children and adolescents and concluded a strong association existed between the duration of depression and increased suicidality. Kaslow, Rehn, and Siegel (1984) and Carlson and Kashani (1988) found depressed children demonstrated the following characteristics: lower self esteem, more depressive attributions, and self control deficits such as negative self evaluation. Depressed children are more likely to exhibit lower expectations for performance as well as set more stringent criteria for that performance. They will tend to punish themselves more and reward themselves less. Consequently, early detection and treatment are critical.

Beginning in the 1980's, comorbid studies began to validate the existence of ADHD with depression. Clinicians began to refute the tendency to seek and attend to information that confirms an initial hypothesis (confirmatory bias) and generate multiple diagnostic hypotheses regarding the diagnosis of adolescents. These multiple hypotheses opened the door for a variety of options to exist. A student could be ADHD, could be depressed or possibly have a comorbid condition with both ADHD and depression. Goldstein and Goldstein (1990) have linked depression to ADHD in studies and Staton and Brumback (1981), found the symptoms of ADHD existed in up to 60 percent of the depressed children they studied.

Weinberg and Emslie (1991) found 63 of 100 referred children met the criteria for ADHD. Forty-six of those 63 were clinically depressed as well. The long term follow-up studies of children with ADHD and another disorder indicate these children have poorer outcome because of greater social, emotional, and psychological difficulties (Biederman et al., 1991).

Kolvin et al. (1991) found the residual effects of comorbidity were significant and concluded that to ignore these effects may be to ignore treatment needed for the

unidentified disorder. The treated disorder may improve, but the child/adolescent continues to suffer from the untreated disorder. Thus, the need to investigate comorbidity is serious because of the implications for treatment, interventions, and placement.

Misdiagnosis or the condition of comorbidity may be a reason for the difficulties in treatment for ADHD. Despite the success of stimulant treatment (Jacobvitz, Sroufe, Stewart, & Leffert, 1990) for children up to early adolescence, the effects of stimulant use through adolescence and into adulthood has not been supported. In addition, the long-term studies completed have not found evidence for the efficacy of stimulant treatment. On the other hand, there are some emotional and psychological consequences of stimulant treatment which have been documented (Diller, 1996). There does not appear to be a physical addiction, but there is the possibility of psychological dependence not only for the child, but for the family and other adults as well. Due to the fact that parents, adults and others are more aware of ADHD than the adolescent, the question of "Did you take your pill today?" sends a message to the child that the drug is important for their performance and that they alone can not control themselves.

The challenge for school psychologists in assessing adolescents is to identify disorders/disabilities in an efficient and effective manner in order that appropriate school interventions and placements are implemented. To differentiate with the present classification system of the DSM-IV (1994) is difficult because of the inclusionary method it uses. Each symptom is given equal weight; therefore, the defining symptoms of a disorder need only be associated with a disorder rather than required for the diagnosis. This type of taxonomy allows a multiple number of ways in which categorical membership is determined. Presenting characteristics of students with the same disorder could vary to the point that it is hard to recognize members within the same disorder.

To complicate matters further, one disorder may have criteria similar to another disorder. For example, depression criteria can look similar to ADHD symptoms. Low self-esteem, poor concentration, irritability, crankiness, and poor social skills are found in both depression and ADHD criteria (DSM-IV, 1994). Such symptom overlap can result in misdiagnosis.

Statement of the Problem

Comorbidity issues complicate medical diagnosis, treatment and intervention plans for adolescent students with ADHD. The literature supports the comorbidity of ADHD with conduct disorders, anxiety disorders, and learning disorders; less is known about ADHD and depression (Barrickman et al., 1995; Biederman et al., 1991; Kashani et al., 1987; Weinberg et al., 1989). What is known is ADHD medication is not as effective with adolescents as with children and there is limited research available with the adolescent population regarding ADHD and depression.

The school psychologist needs useful diagnostic information to help identify those adolescents who are depressed, in addition to ADHD. A systematic approach that has recently been tried in a series of investigations is conditional probability (Laurent, Landau, & Stark, 1993). This analysis examines the Sensitivity, Specificity, Positive Predictive Power (PPP), and Negative Predictive Power (NPP) of symptoms/items related to a diagnosis. Each of these item statistics is calculated from one another with the knowledge of the base rates of the disorders and the symptoms/items. Direct information is provided on the hit rate of the diagnostic criteria. Knowing the positive and negative predictors of ADHD and depression would allow the school psychologist to better serve

those students who are identified. The implications of this knowledge results in more effective interventions and placements in the classroom.

Purpose of the Study

The purpose of this study is to determine if items on the Attention, Hyperactivity, and Depression scales of the Teacher Rating Scale of the Behavior Assessment System for Children (BASC) can assist in diagnosing students with depression who are identified as ADHD. Teachers were chosen as the raters in place of parents because often depressed children have a depressed parent/parents. This depression distorts the results of the parental ratings of their own children (Kovacs, 1989). Teachers are more likely to provide an objective rating of student behavior because of their ability to compare the behavior to other students in the class and their ability to assess behavior in different situations than are typically found at home (e.g., sit still in a group situation) (Weller, Weller, & Fristad, 1995). Adolescents from a school population were selected due to the limited number of studies found in the literature with this group (Reynolds & Kamphaus, 1990). School population data are more relevant to the school psychologist as they typically work in a school, rather than a clinical setting.

Research Hypotheses

The following null hypotheses were identified:

Null Hypothesis I: Items on the a) Attention, b) Hyperactivity, and c) Depression scales of the BASC Teacher Rating Scale will not have sensitivity or PPP in identifying students who meet criteria for depression on the CDI.

Null Hypothesis II: Items on the a) Attention, b) Hyperactivity, and

c) Depression scales of the BASC Teacher Rating Scale will not have specificity or NPP

in identifying students who meet criteria for depression on the CDI.

Significance of the Study

School psychologists are trained to make decisions about disabilities/disorders

based on assessment information. These decisions can be difficult to make because the

disorders have vague criteria and overlapping symptoms. Consequently, if a student

meets the criteria for a disorder, one cannot be assured that those symptoms are related

only to that disorder. It could be that they are associated with the disorder but may not be

the most predictive of that disorder. Rather, the absence of a symptom may actually be

more helpful information in predicting an alternative disorder.

In order for school psychologists to make appropriate decisions, it would be

beneficial to know which items on a rating scale have the most PPP or NPP for a

disorder. The decisions made concerning disabilities/disorders would then reflect a more

objective based response rather than one that relies on intuition which often results in

error and bias.

There are no studies to date that have attempted to delineate the predictive power

of items on the Attention, Hyperactivity, and Depression scales of the BASC Teacher

Rating Scale for adolescents with ADHD. Knowing the predictive power of specific

items would allow the school psychologist the ability to delineate between disorders more

successfully. Once items have been analyzed and the predictive power established the

school psychologist could identify the student who may be at risk based on individual

items even though they may not have an overall significant scale score.

Limitations

This study is subject to the following limitations:

1. The samples were restricted to the age range of 12 through 18. Therefore, results cannot be generalized to other age levels.

2. The sample was collected from the northeastern part of Oklahoma in a suburban school district. Therefore, results cannot be generalized to include all parts of the United States.

3. The method of identification of adolescents with ADHD was limited to nurse's records and parental report. There was no information collected from medical doctors to confirm the ADHD diagnosis. Therefore, results cannot be generalized to include adolescents who have confirmed diagnosis from medical doctors.

4. Some of the participants were on medication and others were not. In addition, the participants were not all on the same medication. Therefore, results cannot be generalized to groups that are on the same medication for ADHD.

CHAPTER II

REVIEW OF THE LITERATURE

Attention Deficit Hyperactivity
Disorder

Introduction

The purpose of this chapter is to review the literature related to Attention Deficit

Hyperactivity Disorder (ADHD), Depression, and the comorbidity of the two disorders in

the adolescent population. Specifically, the prevalence, definition, manifestations in the

classroom, and the etiology of each of the disorders of ADHD and depression will be

reviewed. Comorbidity research related to ADHD and depression since 1972 and

medication issues related to the two disorders will be reviewed as well. Finally, the

analysis of conditional probability will be introduced as an effective method for school

psychologists to identify specific symptoms that are more likely to be predictive of the

presence or absence of a disorder.

Prevalence

The reported prevalence of ADHD is varied depending on the sample

investigated. Berry, Shaywitz, and Shaywitz (1985) estimated prevalence rates ranging

from 1.2 to 20 percent of all school children while Barkley (1990) indicated 3-5 percent

of school-age children or approximately 1.5 million children are affected with the disorder. In clinic populations as much as 40 percent of the referrals to child guidance centers are ADHD. Males tend to outnumber females in a 6:1 ratio for clinic-referred populations and a 3:1 ratio for community based samples (Barkley, 1990). Children with the disorder tend to have lower self-esteem, greater depression, more academic failure, and more aggression and are more irritable than normal children. The impact of ADHD on society is enormous. Students with ADHD are a source of stress in their families, are a disruption in schools, are a financial cost, and are at a greater risk of developing criminal behavior (Biederman et al., 1991). Long term follow-up studies indicate that children with ADHD and another disorder have poorer outcomes because of greater social, emotional, and psychological difficulties (Biederman et al., 1991).

<u>Definition</u>

ADHD as a classification has been plagued by numerous changes in definitions, diagnostic criteria, and terms used to describe the condition. In the 1930's, youth with ADHD were labeled brain damaged. In the 1940's, practitioners saw them as having the Strauss syndrome. By the 1960's, common labels were minimal brain disfunction and hyperkinetic impulse disorder. In the 1970's, the name hyperkinetic reaction of childhood was adopted. The 1980's saw the disorder referred to as ADHD (Weinberg & Emslie, 1991). With the publication of the most recent <u>DSM-IV</u> (1994), attention deficit is included under a superordinate category of Attention Deficit and Disruptive Behavior Disorders (Cherkes-Julkowski, Sharp, & Stolzenberg, 1997). The formal definition is: "a disorder having an essential feature of a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequent and severe than typically observed in

individuals at a comparable level of development" (DSM-IV, 1994) (Appendix A).

Because of this confusion in definitions and diagnostic criteria, the concepts of

inattention, impulsivity, and hyperactivity need to be discussed in regards to their current

meaning.

Attention is a multidimensional construct that involves the attentional system of

the brain. The first step in activating this system involves an optimal level of alertness

and arousal (Best, 1992; Cooley & Morris, 1990). If the system is unable to seek

stimulation one may appear to be passively off task or unable to monitor the environment

for important cues or feedback. In addition, development of self-monitoring skills may

be hampered (Cooley & Morris, 1990; Voeller, 1991). Visual and auditory processing

skills also affect the ability to attend. Inattention, impulsivity, and inappropriate behavior

are often directly related to the ability to process complex and long directions (Cooley &

Morris, 1990). The areas most often referred to in regards to attention are attentional and

distractible shifts, divisibility of attention, selective attention, and sustained attention.

The attentional shifts attributed to students with ADHD have also been thought of

as distractibility and this is true if the shift is only attentional. Attentional shifts occur

when the task switches from one to another such as changing from math to spelling.

Another shift is the result of moving from an external stimulus such as the teacher giving

directions to an internal control of cognitive problem solving. Still another attentional

shift is found when one shifts from the task at hand (classwork) to a more important

external stimulus (fire drill) (Voeller, 1991). However, if the shift is behavioral, it is

more likely a result of impulsivity or a behavioral disinhibition order (Barkley, 1990;

Cherkes-Julkowski et al., 1997; Voeller, 1991).

The divisibility of attention refers to the ability to attend to more than one task at a time (Best, 1992; Cooley & Morris, 1990). This occurs when one needs to listen to the teacher as well as take notes. For many students this is very difficult, while for gifted students the opposite is true. In other words, more cognitively adept students may actually need to challenge their attentional skills by doing more than one task at a time (Kirk, Gallagher, & Anastasiow, 1993).

The process of selective attention occurs at a subconscious level where the novelty of a situation is a powerful determinant for what is selected (Barkley, 1989; Cherkes-Julkowski et al., 1997; Cooley & Morris, 1990). Selective attention is the ability to focus on the task at hand while still being able to monitor extraneous stimuli for its importance to the situation. Once something is selected, sustaining attention becomes the challenge especially when the tasks are dull and repetitive e.g., independent school assignments, homework, chores at home (Barkley & Ullman, 1975; Routh & Schroeder, 1976; Zentall, 1985). Distractibility is often the reason given for the poor sustained attention; however there is another line of thinking (Barkley, 1990; Cooley & Morris, 1990) that it is not distractibility rather it is a diminished persistence of effort on tasks that have little interest to them.

Behavioral disinhibition, or impulsivity, is the inability to inhibit ones behavior in response to a situational demand. Impulsivity is a multidimensional construct that has been defined as a pattern of rapid, inaccurate responses to tasks, an inability to delay gratification, or a deficit in regulation or inhibition of responses in social situations (Brown & Quay, 1977; Gordon, 1979; Rapport, Tucker, DuPaul, Merlo, & Stoner, 1986). Although impulsivity appears to be closely linked to hyperactivity (Achenbach & Edelbrock, 1983), it is not currently considered as significant as it was in the past in

defining the disorder. There is more likelihood that students are off task because of an inability to sustain attention to a boring task with little immediate consequence rather than being off task because of a more inviting activity. In the current DSM-IV (1994), hyperactivity and impulsivity are combined to form one subtype entitled hyperactivity/impulsivity.

Hyperactivity is best characterized as excessive or developmentally inappropriate levels of activity. It is common to see fingers or feet tapping, legs swinging, and/or a body wiggling in the chair. Getting up and down from an activity and doing several things at one time are typical behaviors. In addition to the body movement, it is not unusual to see hyperactive students continually talking about what is going on around them and talking out of turn. Often this need for movement or vocalization has no purpose and is unrelated to the task or situation at hand. Jacob, O'Leary, and Rosenblad, (1978) and Luk (1985), found limited support for the idea that overactivity is not the problem, but rather the regulation of activity level to the setting or task is the concern. Most importantly studies have shown that in distinguishing ADHD from other disorders, hyperactivity and impulsivity are more representative of the disorder than inattention (Barkley, 1990).

In addition to hyperactivity, two other characteristics have been identified as deficits in students with ADHD: rule-governed-behavior and greater variability of task performance (Barkley, 1990). Rule governed behavior refers to an inability to comply with the demands of others. This does not imply noncompliance (actively refusing to obey through the use of verbal or physical resistance); rather rule governed behavior deals with compliance to an immediately preceding stated rule. Students with this inability also have difficulty with tracking, a concept that involves a correspondence over

time between a previously stated rule and an individual's behavior (Zentall & Hayes, 1983).

Greater variability of task performance was initially noted by Douglas (1972) in the early 1970's when he observed students with ADHD often demonstrated considerably larger than normal standard deviation differences on multitrial tasks. This difference was noted not only in the number of problems completed but also in the accuracy of completion. Students' performance would vary from moment to moment as well from day to day on the same task in the same setting. Barkley (1990) suggests the observation of such variability may be a hallmark of the disorder.

<u>Manifestations in the Classroom</u>

Although hyperactivity, attention and impulsivity improve as a child matures, adolescence is particularly difficult time because of changes occurring physically and socially (Attention Deficit Disorders, 1991). In the classroom, the adolescent may shift from one uncompleted activity to another without closure. Sequencing and completing steps in an assignment is problematic. Following through on instructions is difficult, as well as sustaining attention to an activity. Completed work is often fraught with careless errors because the time is not taken to recheck or self monitor work. In an exam situation a student with ADHD may attack an activity and then get bored and give up after a few questions. Written work may take extended time because of the problem of low fluency of production. Organization is usually a problem, and as a result work often appears messy and sloppy. Verbally, the ADHD student may give answers to questions before the question is completed. They will tend to have good hearing but listen poorly. Waiting for their turn is agonizing and usually they do not. Transition times are usually

difficult for the student with ADHD, and as a result they will often take an excessive amount of time to reorganize their desks for the next activity. Unstructured time creates problems and they will tend to waste it. It is not unusual to see students with ADHD involved in physically dangerous activities where they have not considered the possible consequences (Attention Deficit Disorders, 1991).

Socially they tend to misread social cues and do not understand body language. Agitated behavior will be seen when there is any sense of pressure or competitiveness in the air. Frequently students with ADHD put themselves down and demonstrate low self-esteem (e.g. poor hygiene, posture). Losing things is very common both at home and at school. Finally, prioritizing of what is important and having a plan is difficult. They may start out with good intentions but usually the final result is less than satisfactory.

In summary, ADHD affects approximately 1.5 million children, typically they are male and they tend to have lower self-esteem, greater depression, more academic failure, more aggression and are more irritable than normal children. The impact of this disorder is enormous on society and the long-term follow-up studies suggest that children with ADHD and another disorder have an even poorer prognosis for the future. ADHD has been redefined each time the DMS is published. Currently, the consensus is that inattention, hyperactivity, impulsivity; all plays a part in the disorder. In addition, deficits in rule-governed-behavior and variability of task performance has become characteristic of the disorder. Classroom manifestations of ADHD have ranged from attentional shifts to involvement in dangerous physical activities without regard to the consequences. Realizing the complexity of ADHD we will now examine the suspected etiology of the disorder.

<u>Etiology of ADHD</u>

ADHD is not thought to have a single cause. Several explanations have been suggested. It is important to note that most findings of etiologies have been correlational therefore, causality can not be determined. Those that have been found most often in the literature are neurological variables, hereditary influences, and environmental toxins (Barkley, 1990; Cherkes-Julkowski et al., 1997).

<u>Neurological Factors</u>

Neurological variables have always been a leading explanation for the symptoms associated with ADHD. As early as the 1800's persons who had severe head trauma were described as overactive, impulsive, inattentive and distractible. These individuals were compared to individuals who were mentally retarded. It was hypothesized that since the mentally retarded were brain damaged and hyperactive, then those that had experienced severe head trauma and became over active were also brain damaged (Goldstein & Goldstein, 1990). This idea was widely believed until research in the 1970's found that less than five percent of children who were hyperactive had any evidence of structural damage. It was concluded that most children with brain damage do not become hyperactive (Stewart & Olds, 1973).

Another neurological variable is an underactivity of the prefrontal cortex, which controls the inhibition of behavior and mediating responses to environmental stimuli. Zametkin, Nordalh, Gross, and King (1990) investigated this variable using the positron emission tomography (the PET scan) to measure brain blood flow. Participants were asked to press a button to indicate the least intense of three tones presented. Results

found approximately an eight percent decrease in glucose utilization in the pre-motor and the superior prefrontal cortex in adults with ADHD with childhood onset.

A final neurological factor consideration is a deficiency of certain neurotransmitters such as dopamine and norepinepherine in certain areas of the brain (Barkley, 1990). The premise is that the dopamine distribution center may be malfunctioning (Cherkes-Julkowski et al., 1997). The use of medication (i.e. Ritalin, Cylert, or Dexedrine) appears to correct the symptom problem but does not explain the underlying cause of ADHD (Goldstein & Goldstein, 1990).

Genetic Factors

Research in the area of genetic influences has produced the most likely explanations for ADHD. The disorder appears to run in families specifically in immediate family members of those diagnosed as ADHD. A positive family history of ADHD symptoms is four times as common in parents of children with ADHD as it is in normal controls (Cantwell, 1972). In addition, first degree relatives of children with ADHD have been found to have an increased rate of ADHD (Biederman, Faraone, Keenan, Knee, & Tsuang, 1990). The most promising area to support the genetic factor of ADHD has been demonstrated in twin studies. Identical twins appear to show greater concordance than fraternal twins do. Unfortunately these studies have been small and gender compositions of the pairs have been varied, so the ability to make any significant conclusions is limited (Goodman & Stevenson, 1989; Willerman, 1973). Yet, Barkley (1990) still attributes 30-50 percent of the etiology of ADHD to the genetic influence.

<u>Environmental Toxins</u>

A final common area of suspected etiology for ADHD is environmental toxins. This includes nutritional factors and prenatal exposure to drugs and alcohol. The nutritional factor aspect suggested that food additives, especially food dyes and preservatives caused ADHD or worsened an existing condition. Although this gained media attention in the 1970's and 1980's (Feingold, 1975) there have not been any controlled studies to support this position. It was even suggested that excess sugar ingestion was a contributing factor to the cause of ADHD; however, this has not been substantiated. In contrast, the concept of prenatal exposure to cigarette smoke has been found to have a correlational relationship to an anoxic effect on the developing brain. In addition, maternal alcohol use during pregnancy has been associated with hyperactivity (Barkley, 1990). Overall, the conclusion appears to be that environmental toxins in general play a minimal role in the causation or maintenance of ADHD (Barkley, 1990; Birmacher et al., 1996).

In summary, the etiology of ADHD is primarily attributed to genetic influences although disruption in neurological pathways is a contributing factor; it is unlikely this accounts for much of the disorder. Environmental factors may exacerbate the condition but are unlikely to be considered seriously in the etiology of the disorder (Barkley, 1990).

<div align="center">Depression</div>

<u>Prevalence</u>

Prevalence rates of depression in children range between 0.4 and 2.5 percent and between 0.4 and 8.3 percent in adolescents. The lifetime prevalence rate of Major

Depression Disorder (MDD) in adolescents has been estimated to range from 15 to 20

percent, similar to that found in the adult population, suggesting that depression in adults

often begins in adolescence (Birmacher et al., 1996). DSM-IV (1994) reports the

proportion of boys to girls with depression in prepubertal children is equal, whereas in

adolescent and adult populations, females are twice as likely to be depressed as males.

The differences between the genders is unclear, but it is attributed to genetics, increased

prevalence of anxiety disorders in females, biological changes associated with puberty,

cognitive predisposition, and socio-cultural factors (Breslau, Schultz, & Peterson, 1995;

Reinherz et al., 1989).

Definition

Depression as defined by the DSM-IV (1994) has multiple types and associated

features. Those related to adolescents include major depressive episode, manic episode,

mixed episode, hypomanic episode, and dysthymia. A Major Depressive Episode is

characterized by a two-week period of a change in mood from previous functioning

where there is a symptom of depressed mood or loss of interest or pleasure in most

activities. In adolescents the mood may be irritable instead of sad, there may be a change

in appetite or weight, sleep activity is affected, energy is decreased and psychomotor

activity is different from typical functioning. Distractibility is demonstrated by difficulty

in thinking, concentrating, or making decisions. Suicidal thoughts are considered and

feelings of worthlessness or guilt are apparent (Appendix B).

Manic Episodes are different from Major Depressive Episodes in that they last at

least one week as compared to two and there is an abnormal and persistent elevated,

expansive, or irritable mood. If the mood is irritable at least four additional symptoms

must be evident e.g., inflated self esteem, decreased need for sleep, pressure of speech, flight of ideas, distractibility, or psychomotor agitation (Appendix C).

A Mixed Episode is a combination of both major depressive episode and manic episode where the criteria for both are met nearly everyday for at least one week. Typical symptoms are agitation, insomnia, appetite dysregulation, psychotic features, and suicidal thinking (Appendix D).

The Hypomanic Episode is defined as a period of abnormal and persistent elevated, expansive, or irritable mood lasting at least four days. Four additional symptoms from the list of major depressive episode symptoms must accompany this period if the mood is identified as irritable (Appendix E).

The last type is Dysthymic Disorder and it differs from the other types in its severity, chronicity, and persistence. A Dysthymic Disorder is more difficult to document because the symptoms are less severe than the other types even though they have persisted for a much longer period of time. For adolescents, dysthymia may be demonstrated by an irritable rather than depressed mood and the minimum duration is one year. In addition to the time length, two additional symptoms must be observed e.g., poor appetite or overeating, insomnia or hypersomnia, low energy or fatigue, low self-esteem, poor concentration, difficulty making decisions, or feelings of hopelessness (Appendix F) (DSM-IV, 1994).

The five depression categories described above all have symptoms that are unique to each disorder and symptoms that are characteristic of all of the disorders. At the same time, some of the symptoms that characterize depression i.e. irritability, distractibility, and psychomotor agitation are also found in ADHD. If manifestations in the classroom

and etiologies are also similar, could there be the possibility that misdiagnosis of the disorders occurs? It appears further investigation is needed to answer that question.

Manifestations of Depression

Depression is manifested in the classroom in academic areas, social/behavioral situations, cognitive responses and affective domains (Stark, 1990). Academically, adolescents lose interest in their school subjects and their performance suffers. The effort to finish work declines and assignments completed may be messy and give the appearance of indifference to quality work. Work that is completed reveals feelings of hopelessness, helplessness, worthlessness, and guilt (Gabrielle, Carlson, & Kashani, 1988). Adolescents will give up more quickly and eventually may stop doing any work (Stark, 1990).

Socially, depressed adolescents may become agitated and disrupt the classroom with their hyperactivity. The agitated student appears unable to sit still and is in a constant state of movement. He/she may fidget, pace, rub, or pull on self or clothing. Speech may be affected and language may sound as though it is bursting forth and the adolescent has no control over his/her talking. They may alienate peers or withdraw from social contact. Social isolation may also result in an over involvement with pets in place of people.

Cognitively, their ability to respond becomes impaired with decision making and concentration most commonly affected. It is not unusual for the student to begin to think they will fail and then they eventually do. Thoughts of death and expressions of suicidal wishes may occur.

Depressed adolescents' affect can be irritable and excessively negative. Their self-esteem declines and they tend to feel guilty and dysphoric (Gabrielle et al., 1988). Routines are often not tolerated because of the need to be distracted from unwanted feelings. It is not unusual to see temper tantrums, stealing, running away, truancy, and rebelliousness. In the past these behaviors were identified as "masked depression." Acting out was thought to be a defense to avoid experiencing painful feelings (Swartz & Benjamin, 1980). Cytryn and McKnew (1972) attempted to provide a theoretical network for understanding depression when they proposed a tripartite classification of childhood neurotic depression as acute, chronic or masked. The concept of masked depression was the most accepted and suggested that depression might present differently for each age and that the psychopathological correlates were varied and unique to each age level. In other words, adolescents act delinquent to mask depression. This concept faded in popularity when it was determined that this was an appropriate developmental reaction to depression and has since been referred to as "secondary reactions to depression" (Lesse, 1983). Although it may be appropriate to have a secondary reaction to depression, this suggests that more than one condition may occur at the same time.

Etiology of Depression

Explanations for the etiology of depression have been difficult to determine because of the lack of consensus among the experts. Most of the theories have different perspectives concerning the disorder but often are used in combination to explain and treat the disorder. More than likely the etiologies are similar to those associated with ADHD, i.e. neurobiological and the genetic/hereditary influences.

Biological Theory

The biological theory of depression is explained by Nelson (1991) (as cited in Wood, 1991) when he discusses the antidepressant medications, which are used in treating depression:

> The mechanism of action of antidepressants has provided many clues to understanding the causes of depression. The major hypothesis about this mechanism is that of receptor sensitivity or the theory that changes in different receptor systems that occur during chronic treatment of depression may be related to the way in which the antidepressant medication works, according to Dennis S. Charney, M.D. The hypothesis is that chronic antidepressant treatment enhances serotonin transmission through changes in a different receptor system, rather than through the blockage of serotonin reuptake. (p. 193)

Nelson (1991) continues:

> . . . some antidepressants, such as the tricyclics, the tetracyclic maprotiline and mineserin (also electroconvulsive therapy) enhance serotonin function by sensitizing the postsynaptic neurons to serotonin. As a result, increased neurotransmission through the serotonin system occurs in areas such as the cerebral cortex, thalamus, hypothalamus, and hippocampus . . . serotonin reuptake inhibitors such as fluoxetine, fluvoxamine, citalopram, sertraline and the MAOIs appear to desensitize the autoreceptor that acts as a break on the serotonin system. The net effect is increased serotonin release. (p. 193)

Hereditary/Genetic Theory

The second theory suggested by the literature is that of hereditary/genetic factors. Adolescents with immediate relatives (e.g. parent, brother, or sister) who have major or bipolar depression have a 25 to 30 percent chance of developing the disorder sometime in their lifetime. If both parents have a major affective illness, the chances of developing a major mood disorder rises to 70 percent (Birmacher et al., 1996; Cytryn & McKnew, 1996). Evidence to support these rates were found in twin and adoption studies where at least 50 percent of the variance in transmission of mood disorders was attributed to the

family when the twins were identical and 25 percent when they were not. It appears there is a strong likelihood that depression is frequently accompanied by other psychiatric disorders. In addition, individuals born in the latter part of the 20th century were at a greater risk for developing mood disorders, although the reason for this was not clear but was most likely due to environmental factors or the interrelation of environmental and genetic factors (Birmacher et al., 1996).

In summary, not only are there similarities in the symptomology of depression and ADHD, but there is also an overlap in the manifestations in the classroom and the etiologies of the disorder. These similarities imply that there is a possibility that misdiagnosis could occur or that one could have a comorbid condition of ADHD and depression. Further investigation is warranted.

Comorbidity of ADHD and Depression

As early as 1972 depression and ADHD were linked by Cytryn and McKnew (1972) when they reviewed cases of youngsters referred to treatment centers for depression and found what they identified as "masked depressive reaction." This reaction was demonstrated in the youngsters by hyperactive/aggressive behavior, poor scholastic performance, and marginal social adjustment. They concluded the hyperactive behavior was a way to force depression into the background. This conclusion infers that if depression is the problem instead of hyperactivity, treatment plans may need to be reconsidered. A medication for hyperactivity may be inappropriate and actually take away the mechanism to cope with depression, setting the adolescent up for a depressive condition.

This research was supported by a study completed by Swartz and Benjamin (1980) involving eighteen boys age 5-13 years in a residential school. The purpose of the study was to investigate the relationship between hyperactivity, the related disorders of aggressivity and inattentiveness, and childhood depression. All boys were diagnosed as severely emotionally disturbed and displayed some level of hyperactivity. The level of hyperactivity was confirmed using the criteria of the DSM-III (1980) criteria. Teachers rated the boys on five factors of the Conners' Teacher Rating Scale (TRS): aggressivity, inattentiveness, anxiety, hyperactivity, and sociability. The factors of anxiety and sociability were not used because the authors believed anxiety was not closely related to hyperactivity and sociability was more likely to be associated with girls. The scores the children made on the Children's Depression Inventory (CDI) defined depression. Correlations of the factors of aggressivity, inattentiveness, hyperactivity, and depression were determined using the Pearson product moment coefficient as a measure of statistical relationship. Although aggressivity and inattentiveness were found to occur independently of childhood depression, there was a statistical significant correlation (.489 at the .01 level of confidence) between hyperactivity and childhood depression.

Brumback and Weinberg (1977) suggested that hyperactivity might just be a symptom of depression. Symptoms of depression were classified in major and minor categories. The major symptoms were dysphoric mood and self-deprecatory ideation. To be considered depressed the students had to have both of the major symptoms and any two of the following minor symptoms: agitation, loss of energy, reduced socialization, altered school performance, altered attitude toward school, sleep disturbance, appetite disturbance, or somatic complaints. The authors acknowledged hyperactivity and depression could occur independently, but also found the two were

frequently associated. In their study of 223 children, 74 percent of those with hyperactivity were depressed and 47 percent of those without hyperactivity were depressed. Twenty-five percent were neither depressed nor hyperactive. Their conclusion was depression and hyperactivity can occur simultaneously, but it usually is episodic hyperactivity presented only during a depressive state.

Comorbidity was seen more often between MDD and disruptive disorders (62 percent of cases with depression) than between MDD and anxiety disorders (43 percent of cases with depression) (Cohen et al., 1993). Nearly half of the children with disruptive disorders received more than one diagnosis. Comorbidity within emotional and disruptive diagnostic groups was identical across the ages. Although there was little difference in prevalence of diagnosis of depression between boys and girls, there was a substantial difference in the pattern of the disorder. Both groups were low in early childhood and low at age 20. Girls tended to spike at age 14 while boys were lowest at age 13-14. In regards to ADHD, the rates of boys were two times higher than the girls, but their symptoms tapered off as they grew older and the girls' symptoms remained constant (Cohen et al., 1993).

Kaplan and Shachter (1993) and West et al. (1995) suggested that ADHD predated bipolar for all who met the criteria for both ADHD and bipolar. It was difficult to distinguish between ADHD and bipolar disorders because of the phenomenological overlap. Individual symptoms for ADHD are similar to mania. There was an average of six years difference between onset. They concluded that ADHD and bipolar may be related conditions along a continuum of severity with a subtype of ADHD having possible adolescent hypomania or prodromal bipolar disorder.

Borchardt and Bernstein (1995) reported it was difficult to differentiate between ADHD and bipolar disorder in youth, especially if they occur together. This was supported by an NIMH collaborative study on the psychobiology of depression. Their results indicated bipolar adults and their relative's retrospectively reported higher rates of hyperactivity as children than adults with unipolar depression.

deMesquita and Gilliam (1994) found 42 percent of adolescents diagnosed with depression in their study had a comorbid disorder. This was more often true with early onset of depression. The most prevalent disorders were anxiety, conduct, and ADHD. Their evidence suggested ADHD may not be linked specifically to depression but to clinical disorders in general. Therefore, if the two do exist together, treatment for both may be required rather than just one disorder. Furthermore, they suggested the need to avoid error and bias in clinical judgments by utilizing more empirically based approaches to diagnostic judgment such as conditional probabilities. They concluded the use of conditional probability would develop base rates that could validate the existence of disorders.

Within the last decade Jensen, Burke, and Garfinkel (1988) utilized conditional probability analysis to compare male MDD and ADHD patients with normals to assess the occurrence and overlap of specific symptoms and the relationship of these to the final diagnosis. Their results found if the adolescent was diagnosed with ADHD on the basis of impulsivity rather than inattention, it was a possibility that depression was the primary disorder as opposed to ADHD.

In summary, the literature does reflect that ADHD and depression have similar etiologies (i.e., biological and hereditary/genetic), symptomologies, and manifestations in the classroom. This may explain in part the difficulty in separating the disorders and the

condition of comorbidity between the two. Another factor to support the relationship between the two disorders is the reaction to medication. Are nonresponders to typical ADHD medications without ADHD, do they have another separate disorder or are they suffering from a comorbid condition?

Medication Issues of ADHD and Depression

As early as 1937, stimulants, the most popular and effective treatment for ADHD, were used to treat children's behavioral problems. Nineteen-seventy documented stimulant medication in controlled trials, and it was estimated that 150,000 children were using them in the United States alone. This began a furor that children were being overmedicated in order to control their minds. By 1971, methlyphenidate and amphetamines produced in this country became Schedule II controlled drugs not only in response to the furor of mind control but also as a result of reported epidemic abuse of methlyphenidate in Sweden and the illegal use of stimulants in this country. United States production of methlyphenidate has increased by 500 percent from 1990 to 1995 (Diller, 1996).

Overall, stimulants have been successful for children, but there seems to be less information regarding the success of the drug for adolescents. In at least 25-30 percent (Barkley, 1990; Biederman & Steingard, 1989; Gammon & Brown, 1993) of the cases of ADHD, stimulants are ineffective. Nonresponders have indicated disruptive effects on their sleep and appetite, and roller coaster swings in mood and self-control. Stimulants are unable to adequately control irritability, oppositionality, anxiety, and/or depression symptoms. Tricylic antidepressants when tried alone have proven to improve mood and decrease hyperactivity in ADHD (Biederman et al., 1991). However, they too have

demonstrated limitations in improving concentration, inducing excessive sedation, and cardiovascular side effects.

Recently atypical or novel antidepressants have been considered as alternatives for comorbid conditions of ADHD and depression. These include Fluoxetine, Seratraline, and Paroxetine. These drugs are usually referred to as Selective Serotonin Reuptake Inhibitors. Gammon and Brown (1993) found the combination of Fluoxetine (Prozac) with methlyphenidate resulted in a positive response when the Fluoxetine dosage was gradually elevated. The subjects were thirty-two consecutive patients aged 9-17 with ADHD and a comorbid disorder. Seventy-eight percent of the comorbid disorders were dysthmic disorder and 18 percent were major depression disorder. Within this group 94 percent of the children showed clinically significant responses to the combination of the two drugs. The investigators suggest the fluoxetine may have a direct impact on dopamine and serotonin levels that have been linked to increased impulsivity, aggression, and suicidality (Linnoila & Virkkunen, 1992). In summary, it appears that those adolescents with ADHD presenting with comorbid conditions may do better with the combination of antidepressants and stimulants.

The recognition that depression and ADHD can occur together is valuable information for the school psychologist when assessing students. If the school psychologist had the knowledge that specific symptoms were more predictive of a disorder than other symptoms this would be beneficial in narrowing the diagnosis in order that appropriate recommendations to educational teams could be made. Conditional probability has been utilized in two previous studies described above and shown to be effective in predicting negative and positive power in relation to disorders. It is the intention of this study to apply this analysis to the BASC to find out the most

efficient predictors of ADHD and depression and those that are not predictive, but rather just associated with the disorder. With this knowledge school psychologists will be better able to differentiate those that are ADHD, depressed, or comorbid.

Conditional Probability

Probability analysis was selected because of its ability to facilitate the differential diagnosis of childhood clinical disorders. Conditional probability analysis is nontraditional, in that it is not directed at identifying the probability of the symptom given the presence of the disorder. For example, the question is not if a child is diagnosed as ADHD, what is the likelihood that he/she is distractible. Rather, the question to be answered is what is the probability of a disorder given the child presents with a given symptom. Therefore, if a child is distractible is he/she ADHD? (Laurent et al., 1993).

The technique examines four areas of concern. First, sensitivity is considered. What is the probability of a symptom given a disorder, or true-positive? Second, specificity is examined. In this case specificity refers to the probability of not having a symptom given the absence of a disorder, or true-negative. Third, PPP refers to the conditional probability of the disorder given the presence of the symptom and finally NPP refers to the conditional probability of the disorder given the absence of the symptom (Pelham et al., 1992). Unlike the DSM-IV (1994) that identifies only inclusionary criteria, this technique identifies the most efficient diagnostic inclusionary and exclusionary criteria for a disorder.

Milich, Widiger, and Landau (1987) found support for this design in a study when they discovered lying was suggestive of Conduct Disorder (CD) and ADD. However, if

the child does not lie it was highly unlikely that he would be given a diagnosis of CD. Therefore, the absence or exclusion of lying would rule out a CD diagnosis. In another example, the characteristic of easily distracted, which is typically associated with ADD, was found to be more useful for a CD diagnosis. This symptom occurred rather frequently and was quite common with ADD boys. If it was not present, it strongly suggested that ADD was not present. However, being described as easily distracted was not an efficient indicator of ADD, rather it was more useful as an exclusionary criterion for conduct disorder. These studies supported that those items most descriptive of a disorder may not be the most efficient indicator of a disorder.

In conclusion, the research on ADHD and depression in adolescents continues to evolve. The literature supports the existence of the disorders individually and together as comorbid conditions. The literature also suggests that misdiagnosis of the two disorders is possible because of the overlapping etiologies, symptomology, manifestations in the classroom and ineffectiveness of medical interventions. The purpose of this study is to determine if items on the Attention, Hyperactivity, and Depression scales of the TRS of the BASC can identify students with possible depression who are identified as ADHD. To accomplish this, the statistical analysis of conditional probability was used. The investigator analyzed teachers' behavior ratings of students who are identified as ADHD/depressed and only ADHD. The specific ratings came from the Attention, Hyperactivity, and Depression scales of the BASC. An item analysis of each scale for each student determined which items are most predictive of ADHD, depression, or ADHD and depression.

CHAPTER III

METHOD

The purpose of this chapter is to describe the participants, the procedure of the study, the instruments used and the statistical analysis implemented.

Participants

The original sample included 143 ADHD adolescents from a suburban school district in Northeastern Oklahoma. Of the original sample, 90 adolescents consented to participate in the study. Ages of the students ranged from 12 to 18 years old with a mean age of 15.7 and a standard deviation of 1.45. Eighty-five of the participants were Caucasian, two were Native American, two were Hispanic and one was African American. The participants were predominately Caucasian with only six percent representing minority groups. Sixty-seven of the participants were male and 23 were female. Table I summarizes the participants according to age and Table II summarizes the participants according to ethnicity and gender.

TABLE I

MEANS AND STANDARD DEVIATIONS OF AGE
IN YEARS FOR THE ADHD GROUP

N	Minimum	Maximum	Mean	Standard Deviation
90	12.0	18.0	15.7	1.45

TABLE II

ETHNICITY OF MALES AND FEMALES
IN ADHD GROUP

Ethnicity	Gender	
	Male	Female
Caucasian	62	23
African-American	1	0
Native American	2	0
Hispanic	2	0
Total	67	23
% of Sample	74	26

Procedure

The study and data collection process was approved by the Oklahoma State

University Institutional Review Board, approval number ED-98-107 (Appendix G).

During the school years from 1996-1999 the investigator obtained a list from the school

nurse and a list from the previous ADHD coordinator of those students identified with the

disorder. Once the list was received, the investigator contacted the parents and received

permission for their adolescent to participate in the study. These contacts were initiated

during meetings the parents attended for ADHD information, during Individualized

Education Program meetings, or by phone calls made after school hours.

After explaining the purpose of the study and receiving parental consent, the

investigator mailed to the parent a Parent/Guardian Informed Consent Form, a Personal

Data Information form, and a ADHD Behavioral Checklist (Appendixes H, I, J, and K).

Once the paperwork was returned, the investigator contacted the students during the

school day and asked for their assent/consent to participate. Students that agreed to

participate were asked to complete a Student Informed Assent Form (Appendix L).

When the form was signed the student was asked to complete the CDI. Students were

informed prior to completing the CDI that a positive response to the question about

killing themselves would result in a crisis team meeting with school officials as well as

contact with their parents. None of the 90 students indicated they wanted to kill

themselves.

The final step involved sending a Teacher Informed Consent Form, a copy of the

TRS of the BASC, and the ADHD Behavioral Checklist to one of the student's academic

teachers (Appendix M). Teachers signed the consent form, completed the BASC by

rating the student on a variety of topics related to social and emotional problems, and

checked symptoms they observed in the classroom from the ADHD Behavior Checklist.

Teachers, students, and parents were given the opportunity to receive the results of the

study if they indicated they were interested in the information on their assent/consent

form.

Instruments

Behavioral Assessment System for Children

The BASC is a relatively new broad band instrument on the market that has

separate constructs for depression, hyperactivity and attention. This instrument uses a

multimethod, multidimensional approach to evaluate the behavior and self-perceptions of

children aged 4-18 years. There are five components of the BASC, but only one of the

five was be used in this study. The specific component utilized is the rating scale of

teachers (Reynolds & Kamphaus, 1992).

Published in 1992, the BASC offers an alternative to other instruments on the market. The BASC has several unique features. First, the BASC unlike many other rating scales focuses not only on maladaptive behaviors but also on adaptive behaviors. This feature allows the school psychologist to identify strengths that can be utilized effectively to develop interventions to work on areas of weakness. A second feature of the BASC is the use of validity scales. These scales identify those respondents who are "faking bad" or "faking good." The scales can also identify unrealistic response sets (Brown, 1995). Specifically for this research an attractive feature is that depression has its own construct. Other instruments on the market tend to collapse depression with other mood disorders.

The BASC provides two types of normative scores for each scale: T-scores and percentiles. The T-scores have a mean of 50 and a standard deviation of 10. T-scores are interpreted in relation to their distance from the mean of the group. The percentiles indicate the percentage of the norm sample scoring at or below a particular raw score. Scores are reported in three ranges: clinically significant, borderline significant, and normal. T-scores of 70 and above are considered to be clinically significant, those scores falling in the 60-69 range are of borderline significance, and the normal range is any T-score at or below 59. Three different sets of norms can be used to score the BASC: clinical, general, or gender. The manual recommends the general norms for school usage and that is what is reported in this research.

The TRS consists of 148 items. The response pattern for the teacher form is the same, regardless of the age of the student. The answer choices for the questions are never, sometimes, often, and always. The time required to complete any of the forms is from 10 to 30 minutes.

The internal consistencies of reliability medians of the TRS for the adolescent level are .90 (.77-. 90) at ages 12-14, and .89 (.80-. 94) at ages 15-18. Reliabilities are similar for males and females. The test-retest reliability has a median value of .91.

Validity of the TRS for the adolescent level is found in the pattern of correlations of TRS scales and composites with scores obtained on other behavior measures e.g. Achenbach's Teacher's Report Form and the Revised Behavior Problem Checklist. Correlations range from .84 on the Achenbach scale identified as anxious/depressed to .44 on the Revised Behavior Problem Checklist scale identified as anxiety/withdrawal (Reynolds & Kamphaus, 1992).

Children's Depression Inventory

The CDI is the downward extension of the Beck Depression Inventory and attempts to screen for the DSM-IV disorders of Major Depression and Dysthymia in students age 8-17. Although some of the participants were 18 years old, the investigator chose to use the CDI instead of the BDI for reasons of consistency in the questions asked to receive a total depression score. The CDI has 27 items that assess disturbed mood, hedonic capacity, vegetative functions, self-evaluation, and interpersonal behavior. The adolescent is asked to choose from three statements that best describe him/her in the last two weeks. A score of 0 being least important to 2 being most serious can be selected. The T-scores range from below 30 to above 70. The author suggests a T-score of 54-55 as significant for depression where a higher incidence of depression is expected. A T-score of 60 or above is considered significant in general screenings for indications of a depressive disorder. Depression in this research was defined as a T-score of 60 or above on the total CDI scale score (Kovacs, 1992).

Internal consistency of reliability ranges from .71 to .86 within psychiatric and normal populations. Test-retest reliability coefficients are moderate for psychiatric groups at .59 over six weeks and high for normal subjects at .84 over nine weeks (Saylor et al., 1984) Interrater reliability is reported as .55. Criterion validity is demonstrated by studies of children who were independently diagnosed as depressed and had a significantly higher score on the CDI as compared to those students who were not depressed (Kovacs, 1982; 1983). Concurrent validity was determined as positively correlated against the Revised Children's Manifest Anxiety Scale and negatively correlated with the Coopersmith Self-Esteem Inventory. The CDI provides adequate psychometric properties and currently is the most widely used self report measure available on the market for children/adolescents (Kavan, 1992).

Personal Data Information

The Personal Data Information form was designed by the investigator and asks questions concerning demographics about the student and his/her family (Appendix J).

ADHD Behavioral Checklist

The ADHD Behavioral Checklist was taken from the DSM-IV (1994) on ADHD (Appendix K). The purpose of this sheet was to lend support to the ADHD diagnosis.

Research Design and Statistical Analysis

Modern probability theory has three basic axioms that can be summarized as follows:

"Definition: Given the sample space (S), and the family of events in the S, a probability function associates with each event A a real number $p(A)$, the probability of event A, such that the following axioms are true:

1. $p(A) \geq 0$ for every event A

2. $p(S) = 1.00$

3. If there exists some countable set of events, $\{A_1, A_2, \ldots, A_N\}$ and if these events are all mutually exclusive, then $p(A_1 \cup A_2 \cup \ldots \cup A_N) = p(A_1) + p(A_2) + \ldots + p(A_N)$. The probability of the union of mutually exclusive events is the sum of their separate probabilities"(Hays, 1988).

In addition to the three axioms probability theory has 5 rules:

1. Probability rule 1: $p(\bar{A}) = 1 - p(A)$ This is the rule of complementary probability which states the probability of the event $\bar{A}$ (not A) is one minus the probability of the event A.

2. Probability rule 2: $0 \leq p(A) \leq 1.00$ for any event A. This is the rule of probability range which means only positive numbers lying between 0 and 1, inclusive, may be used to signify probabilities.

3. Probability rule 3: $p(\varnothing) = 0$ for any S. This is considered the rule of impossible event meaning the impossible event ($\varnothing$) always receives the probability of 0.

4. Probability rule 4: For any two events A and B in S, $p(A \cup B) = p(A) + p(B) - p(A \cap B)$. This is called the "or" rule of probability. The probability of the event "A or B" is always equal to the probability of event A plus the probability of event B, minus the probability of the event "A and B."

5. Probability rule 5: If the set of events $A, \ldots, L$ constitute a partition of S, then $p(A \cup \ldots \cup L) = p(A) + \ldots + p(L) = 1.00$. This is called the partition rule. When any set of events are mutually exclusive and exhaustive, and thus form a partition of S, the sum of their probabilities must be equal to 1.00 (Hays, 1988).

The common example used to explain basic probability is the toss of a coin. When one tosses a coin the likelihood that you will get heads (event A) or tails (event B) is entirely independent of each other.

In this investigation conditional probability was used to analyze this research. Conditional probability is different from basic probability in that the events in question are not independent of each other and one does depend on whether or not the other has occurred. The advantage to conditional probability is that the likelihood of being correct about an event increases because you know some prior information (Weinberg & Goldberg, 1990). Conditional probability is embodied in the theorem named for Thomas Bayes (Hayes, 1988).

The simplest version of this theorem is: For two events A and B, where none of the probabilities $p(A)$, $p(B)$, and $p(A \cap B)$ is either 1.00 or 0, then the relation must hold:

$$p(A \backslash B) = \frac{p(B \backslash A)p(A)}{p(B \backslash A)p(A) + p(B \backslash \bar{A})p(\bar{A})}$$

"Bayes's theorem gives a way to find the conditional probability of event A given event B, provided that you know the probability of A, the conditional probability of B given $\bar{A}$, and the conditional probability of B given not A ($\bar{A}$). This theorem, which must be true for any pair of events with probabilities summarizes the connection between the conditional and unconditional probabilities" (Hayes, 1988).

This analysis has been applied to a limited number of childhood disorder studies to date (Pelham, Evans, Gnagy, & Greenslade, 1992). The purpose of this study is to find the items on the BASC Attention, Hyperactivity, and Depression scales that are efficient indicators of depression and hyperactivity, rather than items that are most descriptive of the disorders.

Four areas of efficient indicators were examined after a base rate was established for each of the items on the Attention, Hyperactivity, and Depression scales. The base rate was determined by dividing the total number in the study into those that had the item endorsed by their teacher as occurring "sometimes," "often," or "almost always." For example, if 50 of the 100 participants were given a sometimes, often, or almost always rating of "being distractible," the base rate for being distractible would be 50/100, or .50.

The first indicator examined was sensitivity. This was calculated by identifying the number of participants who were screened as depressed and were rated on the item. Those subjects were divided by the total number of depressed adolescents in the sample. For example, a student could be identified as depressed on the CDI and marked by his/her teacher as "Crying easily" on the BASC. This student would then be divided into all the other students who were diagnosed as depressed to get a sensitivity rate for that item (Laurent et al., 1993; Milich et al., 1987; Pelham et al., 1992).

The second category involved the specificity of an item. Those students that were not depressed and were not rated on a specific item were divided by the total number of students who were not depressed. For example, a student who was not identified as depressed and not rated on a specific item by his/her teacher on the BASC rating scale was divided by those students who were not depressed (Laurent et al., 1993; Milich et al., 1987; Pelham et al., 1992).

The third indicator examined was PPP. Those students known to be depressed and also rated on an item were divided by the total number of students who were rated on that item. For example, those identified with depression and rated as someone who "often fidgets with hands or feet or squirms in seat" were divided by all those who were rated on the item (Laurent et al., 1993; Milich et al., 1987; Pelham et al., 1992).

The last indicator examined was the NPP. In this case all the participants who were not depressed and were not rated on an item were divided by the total number not rated on the item. For example, students who were not screened as depressed and were not rated by their teacher on an item were divided by the total number that were not rated on the item (Laurent et al., 1995; Milich et al., 1987; Pelham et al., 1992). Tables III, IV, and V reflect the findings.

CHAPTER IV

RESULTS

Originally, the sample consisted of 143 students identified as students with

ADHD. The investigator received parental permission for 90 of the 143 to participate in

this study. The 90 participants were screened for depression with the CDI to determine if

they were depressed. Results of the screening indicated thirteen (14%) were identified as

depressed. Compared to rates (5%) reported for the school-based assessment of

depression (Anderson, Williams, McGee, & Silva, 1987; Bell-Dolan, Last, & Strauss,

1990), this study identified significantly more than expected. The range of scores of the

14% identified in this study was from a T-score of .60-.83. The student met depression

criteria by having a total depression T-score of 60 or higher. Means, standard deviations,

base rates, sensitivity, specificity, PPP, and NPP for the Attention, Hyperactivity, and

Depression scales of the TRS of the BASC are shown in Tables III, IV, and V.

The purpose of the base rate was to determine how often the behavior described in

an item was endorsed as occurring in the total sample. If the student was reported to have

the item "sometimes, often, or almost always" the item's behavior was scored as

occurring; if the item was rated as never, the rated behavior was considered as not

occurring.

Sensitivity rates were determined independent of the base rates and reflected the

probability of a teacher rating the adolescent's behavior as occurring on a specific item

given the student was diagnosed as depressed. In other words, sensitivity rates identify those items which are characteristic of the disorder.

Specificity rates were independent of the base rates and were defined as the probability of not having an item's behavior endorsed given the absence of the disorder. These rates indicate items which are specific to the disorder. In addition, specificity rates provide us with information that if the behavior is rarely present when the disorder is absent, then when the behavior is present the disorder is highly likely to be present as well.

PPP rates were reported to predict the conditional probability of a diagnosis of depression given that the item's behavior was marked as occurring. PPP rates are the most efficient inclusionary items for identifying whether an adolescent would likely be diagnosed as depressed on the CDI.

NPP rates predicted the conditional probability of the absence of a diagnosis of depression on the CDI given that the item's behavior was not marked as occurring. NPP rates are useful in recognizing the most efficient exclusionary items for identifying adolescents that are not depressed.

Probability rates for sensitivity, specificity, PPP, and NPP were considered not efficient at .50-.59, of little use at .60-.69, relatively high at .70-.79, moderately high at .80-.89, and highly likely at .90 and above (Laurent et al., 1993; Milich et al., 1987; Pelham et al., 1992).

BASC Attention Scale

Examination of the base rates of the Attention scale (Table III) indicates a range of .64 to .93. This implies the Attention scale items were endorsed as occurring in the

total sample 64-93 percent of the time. Teachers observed these items significantly more

than hyperactivity or depression items within this sample of adolescents with ADHD.

TABLE III

BASE RATES AND CONDITIONAL PROBABILITIES OF
THE BASC ATTENTION ITEMS FOR STUDENTS
IDENTIFIED WITH ADHD

Attention Items	Base Rate	Sens	Spec	PPP	NPP
Listens to directions	.93	.92	.06	.15	1.0
Is easily distracted	.79	.85	.21	.15	.89
Does not pay attention to lectures	.74	.85	.26	.16	.91
Forgets things	.64	.77	.36	.17	.93
Is easily distracted from classwork	.83	.92	.17	.16	.93
Has trouble concentrating	.78	.92	.25	.17	.95
Mean	.79	.87	.22	.16	.94
S. Deviation	.10	.06	.10	.01	.04

Base Rate = n who were rated on item/total n
Sens (Sensitivity) = n with disorder who were rated on item/n with disorder.
Spec (Specificity) = n without disorder who were not rated on the item/n without the disorder
PPP (Positive Predictive Power) = n with disorder who were rated on item/n rated on item
NPP (Negative Predictive Power) = n without disorder and not rated on item/n not rated on item

When looking at the sensitivity rates, the results suggest the items on the BASC

Attention scale have a strong pattern of being characteristic of ADHD depressed

adolescents. Rates ranged from .77 to .92 with "Easily distracted in class," "Listens to

directions," and "Trouble concentrating" as most characteristic of depressed adolescents

with ADHD. These results suggest that teachers endorsed the attention items as

occurring in depressed students with ADHD 77-92 percent of the time. "Listens to

directions" is the only item on the Attention scale that is worded in a positive manner. As

a result this item is reversed scored indicating that students having difficulty listening to directions have a high probability of being rated as depressed on the CDI.

Although these items were strongly characteristic of depressed students with ADHD, the specificity rates indicate the attention items were not specific to students with ADHD (range .06-.36) and were of little use.

The PPP of the Attention scale items was low in predicting depression in adolescents with ADHD (range .15 to .17). As noted, the PPP is a proportion of participants with depression whose teacher endorsed an item divided by the total number of participants rated as high on the item. Since the items predict attention deficits as well as depression, they are not able to predict depression only.

The NPP of the Attention scale items was highly predictive of the absence of depression, with a range of .89 to 1.0. This suggests the attention items are useful as exclusionary information. If the teacher marked a student as never having "Trouble concentrating," it is highly unlikely the student is depressed. The most efficient exclusionary items were "Listens to directions" (1.0) and "Trouble concentrating" (.95). These results indicate the behaviors rated by these items were absent for almost all students who were not depressed.

In conclusion, in this sample of students with ADHD, the Attention scale items of the teacher BASC rejected Null Hypothesis I in the area of sensitivity but retained the Null in PPP. Null Hypothesis II was retained in the area of specificity but was rejected in the area of NNP.

Null Hypothesis I: Items on the a) Attention, b) Hyperactivity, and c) Depression scales of the BASC TRS will not have sensitivity or PPP in identifying students who meet criteria for depression on the CDI.

Null Hypothesis II: Items on the a) Attention, b) Hyperactivity, and c) Depression scales of the BASC TRS will not have specificity or NPP in identifying students who meet criteria for depression on the CDI.

BASC Hyperactivity Scale

The base rate of the hyperactivity items in this sample was scattered from .26-.71 (Table IV). These items were endorsed as occurring in the total sample 26-71 percent of the time. Of the thirteen observable items, only three were above a .50 rate. The remaining ten items fell in the range of .28-.47. The behavior items observed the most were the impulsivity items: "Rushes through work" (.64) and "Hurries through assignments" (.71). Surprisingly, the hyperactivity items were in general observed at a much lower rate than the attention items. This would imply teachers perceive adolescents with ADHD display fewer difficulties with hyperactivity and impulsivity in the classroom.

When examining sensitivity rates of hyperactivity items on the teacher BASC of depressed adolescents with ADHD, the range of scores was from .23 to .69. Teachers indicted the items were marked as occurring 23-69 percent of the time in depressed ADHD; however, only 2 of the thirteen items were endorsed by teachers more than 60 percent of the time. "Hurries through assignments" (.69) and "Rushes through work" (.62) were the items most characteristic of the students. The sensitivity rates of items of the Hyperactivity scale in general indicate they were not characteristic of depressed students with ADHD.

TABLE IV

BASE RATES AND CONDITIONAL PROBABILITIES OF
THE BASC HYPERACTIVITY ITEMS FOR
STUDENTS IDENTIFIED WITH ADHD

Hyperactivity Items	Base Rate	Sens	Spec	PPP	NPP
Disrupts the school work of other children	.45	.23	.47	.07	.78
Rushes through assigned work	.64	.62	.32	.16	.83
Bothers other children when they are working	.46	.46	.48	.14	.82
Acts without thinking	.51	.54	.45	.15	.85
Seeks attention while doing school work	.47	.31	.47	.09	.86
Is overly active	.38	.31	.57	.11	.83
Taps foot or pencil	.39	.54	.62	.20	.89
Hurries through assignments	.71	.69	.25	.14	.83
Interrupts others when they are speaking	.41	.31	.53	.10	.82
Talks too loud	.28	.31	.68	.14	.84
Can not wait to take turn	.26	.23	.69	.12	.84
Acts silly	.46	.46	.53	.14	.82
Calls out in class	.36	.31	.56	.11	.83
Mean	.44	.41	.51	.13	.83
S. Deviation	.13	.15	.13	.03	.03

Base Rate = n who were rated on item/total n
Sens (Sensitivity) = n with disorder who were rated on item/n with disorder.
Spec (Specificity) = n without disorder who were not rated on the time/n without the disorder
PPP (Positive Predictive Power) = n with disorder who were rated on item/n rated on item
NPP (Negative Predictive Power) = n without disorder and not rated on item/n not rated on item

Specificity rates ranged from .25 to .69 with only two items >.60. These rates indicate teachers marked "never occurring" on these items for students with ADHD in general less than 60 percent of the time. "Cannot wait to take turn" (.69) and "Talks too loud" (.68) were most specific of the students. The hyperactivity items were, in general; not specific to depressed students with ADHD as diagnosed by the CDI.

The PPP of the hyperactivity items was low. Ranges of items were .07 to .20. The items on the Hyperactivity scale were not able to predict depression in adolescents with ADHD.

In contrast, the NPP of the hyperactivity items resulted in a range, which was relatively high to moderately high (.78-.89), indicating a consistent effect across items. These results suggest if an item was marked as never occurring, it was highly likely the adolescent was not depressed.

In conclusion, in this sample of students with ADHD, the Hyperactivity scale items of the teacher BASC retained Null Hypothesis I in the area of sensitivity and PPP. Null Hypothesis II was retained in the area of specificity, but was rejected in the area of NPP.

<div align="center">BASC Depression Scale</div>

The base rates for the depression items were scattered from .02 to .41, all relatively low (Table V). This implies the Depression scale items were endorsed as occurring in the total sample 2-41 percent of the time. It may be that because of the low frequency of endorsement of items, the items are not useful as indicators of depression. That is the base rate is so low, the items are not likely to be sensitive to depression.

However, the items might be very specific to depression. That is, one could almost be assured the adolescent was depressed, if an item were marked even though a teacher seldom observed the item. For example, the base rate of "I want to kill myself " is .02. With this item being endorsed so seldom it is difficult to use it as an indicator of depresson. Yet, if it were marked, it would be highly likely the student would be depressed. The item "Is sad" had a base rate of .42 suggesting it was observed more often, making it more useful as an indicator of depression in the ADHD population.

TABLE V

BASE RATES AND CONDITIONAL PROBABILITIES
OF THE BASC DEPRESSION ITEMS OF
STUDENTS IDENTIFIED WITH ADHD

Depression Items	Base Rate	Sens	Spec	PPP	NPP
Says, "I don't have any friends"	.09	.31	.94	.50	.90
Says, "Nobody understands me"	.19	.23	.81	.18	.89
Is sad	.42	.54	.59	.18	.90
Says, "I hate myself"	.04	.15	.96	.50	.88
Is easily upset	.38	.54	.64	.21	.91
Says, "I want to die" or "I wish I were dead"	.04	0	.94	0	.85
Cries easily	.05	.31	.97	.80	.90
Says, "Nobody likes me"	.08	.23	.94	.43	.89
Says, "I want to kill myself"	.02	0	.96	0	.86
Mean	.15	.26	.86	.31	.89
S. Deviation	.15	.20	.15	.27	.02

Base Rate = n who were rated on item/total n
Sens (Sensitivity) = n with disorder who were rated on item/n with disorder.
Spec (Specificity) = n without disorder who were not rated on the item/n without the disorder
PPP (Positive Predictive Power) = n with disorder who were rated on item/n rated on item
NPP (Negative Predictive Power) = n without disorder and not rated on item/n not rated on item

The sensitivity rates ranged from 0 to .54 on the Depression scale indicating teachers endorsed the items for depressed students with ADHD 0-54 percent of the time. The most characteristic item of depressed students with ADHD in this sample was "Is sad" (.54) and "Is easily upset" (.54). In comparison, these depression items appear to be less characteristic of depressed students with ADHD than the attention items were. These results indicate that the behaviorally worded items of the BASC Depression scale are not sensitive to depression in this group with ADHD.

The specificity rates ranged from .57 to .94 with six of the nine items falling at or above .94. Teachers observed six of these items as never occurring 94 percent or more of the time in this sample. It is most unlikely a student with ADHD will be depressed if their teacher marked "Cries easily" (.94) as never occurring. Thus, even with seldom endorsed items, the absence of endorsement predicts the absence of depression.

The PPP of the Depression scale items ranged from 0 to .80. If a student was observed by the teacher as "Cries easily" (.80), it was likely the student was depressed. Only two other items were above .50, "Says, I hate myself" and "Says, I don't have any friends." With the exception of the item "Cries easily," the Depression scale in general appears to have little, if any, predictive power.

The NPP of the Depression scale items ranged from .85 to .91. If a student's teacher did not rate the student as "Is easily upset," the chances are .91 the adolescent was not depressed. All items on this scale were predictive of the absence of depression. The scale appears to be more efficient at identifying those who are not depressed rather than those who are depressed. These NPP rates were similar to those for attention and hyperactivity.

In conclusion, in this sample of students with ADHD, the items on the Depression scale of the teacher BASC retained Null Hypothesis I in the area of sensitivity and PPP. Null Hypothesis II was retained in the area of specificity, but rejected in the area of NPP.

CHAPTER V

DISCUSSION

The responsibility of assessing and identifying students with disorders/disabilities is a continual challenge for school psychologists. The results of such assessment directly impact the decisions multidisciplinary educational teams make in placing students in appropriate academic programs and related services.

The purpose of this study was to determine the degree to which items on the Attention, Hyperactivity, and Depression scales of the TRS of the BASC could identify students with depression within a group of adolescents already identified as ADHD. Conditional probability was utilized as a statistical analysis to determine relative diagnostic utility and discriminatory power of the BASC items. This procedure allows for a more accurate and less biased method of efficiently identifying internalizing disorders by looking at base rates, sensitivity, specificity, PPP, and NPP of specific items. Alternative approaches such as conditional probability are needed in assessment because the traditional diagnostic procedures are imprecise and tend to correlate symptoms with diagnosis without concrete data support. Conditional probability looks not only at inclusionary criteria, but also considers exclusionary criteria as valuable and useful diagnostic information.

The Attention and Hyperactivity scales were used because of comorbidity issues. The literature has documented ADHD is comorbid with depression and because of this it is difficult to make decisions for educational placement (Borchardt & Bernstein, 1995; Cohen et al., 1993; Cytryn & McKnew, 1972; deMesquita & Gilliam, 1994; Goldstein &

Goldstein, 1990; Jensen et al., 1988; Stanton & Brumback, 1981; Swartz & Benjamin, 1980; and Weinberg & Emslie, 1990). These decisions could be easier to make if one knew specific items that were indicative of depression, as well as ADHD. By identifying items on the Attention and Hyperactivity scales that were endorsed by teachers as occurring in depressed students with ADHD, one could predict students in the future who may be at risk for depression.

The results of this study did not find support in the Attention, Hyperactivity, or Depression scales for identifying items that positively predict depression in students with ADHD. The study did find support for the NPP of the three scales. Following is a discussion of the conditional probability components, implications for theory and school psychologists, limitations of the study, and directions for future research.

Base Rates

The base rates in this sample were significantly different from one scale to another. Teachers endorsed items on the Attention scale as occurring more often in adolescents with ADHD, than items on the Hyperactivity or Depression scales. This suggests adolescents with ADHD are not observed by their teachers as hyperactive or depressed as often as they are identified as inattentive. It also implies hyperactivity as defined by the items on the BASC is controlled in the classroom setting more successfully than inattentiveness. This may be a result of medical intervention, students moving from class to class every hour, or that the hyperactive behaviors identified by the BASC do not agree with what teachers think of as hyperactive behavior. There are no previous studies to compare the base rates of this investigation. The three studies available (Laurent et al., 1993; Milich et al., 1987; Pelham et al., 1992) differ from this

study in that they were conducted with children twelve and under and one of the two

utilized a referred population. The third study involved students in a suburban school,

but all were boys and all were at least part time special education. Although differences

existed between previous studies and this investigation, five of the hyperactivity items

were observed at a comparable rate. The items "Acts without thinking," "Is overly

active," "Interrupts others when they are speaking," "Cannot wait to take turn," and

"Calls out in class" were observed by teachers in other studies at the same rate as this

study. It is likely such behaviors are problematic to teachers regardless of the students'

age, gender, or classification.

In regards to the base rates of the Depression scale items on the BASC, only one

of the studies (Laurent et al., 1993) above had items relating to depression. In their study,

the base rates of suicidal items were similar to this investigation. The low base rates on

the Depression scale items make it difficult to use the items as predictive of depression

because they occur so infrequently.

Sensitivity Rates

Sensitivity rates of the Attention scale were highly likely to be characteristic of

depressed adolescents with ADHD, whereas the sensitivity rates of the Hyperactivity and

Depression scales were of little use as being characteristic of depressed adolescents with

ADHD. Although the sensitivity rates of the Attention scale are characteristic of

depressed students with ADHD, they are also characteristic of students with inattention.

Therefore, one can not separate those who were only depressed from those who were

inattentive.

The pattern of sensitivity rates is consistent with the base rates for each scale as would be expected. If the teacher did not observe the behavior very often it was unlikely the item was rated as characteristic of the disorder. It appears teachers do not identify the depression items on the BASC as characteristic of depression. This may mean the items are poorly written or the items do not reflect what the teacher is capable of observing. The majority of the items are statements the teacher may never hear the student make. These results imply students may be not be identified as depressed if only the Depression scale on the BASC is used as defining criteria.

Specificity Rates

Specificity rates were low for both the Attention scale items and the Hyperactivity items, whereas the Depression scale had a high rate of items that were specific to depression. Upon examination of the CDI, one finds the same items as those on the BASC Depression scale with the exception of one item. Yet, the BASC Depression scale identified only 2 of the 13 students identified as depressed by the CDI. This strongly suggests the adolescent is a more effective at identifying their own internalized feelings as compared to their teachers.

Positive Predictive Power

The PPP of the BASC items on the Attention and Hyperactivity scales were unlikely to predict depression in students with ADHD. Surprisingly the PPP of the Depression scale was unlikely as well. The one item that was moderately high in PPP was "Cries easily." Yet, because it is observed so seldom (.05) it would be difficult to use

as criteria for depression. On the other hand, if a teacher endorsed it as occurring, it would strongly suggest the student was at risk for depression.

Negative Predictive Power

The NPP rates of the three scales investigated were the most valuable information found in this study for identifying the absence of depression. Therefore, the diagnostic usefulness of items on the TRS of the BASC Attention, Hyperactivity, and Depression scales is found in their NPP or their ability to rule out depression. Only one item on the Depression scale "Cries easily" was a two-way pathognomic, that is it was identified as meeting both inclusionary (PPP .80) and exclusionary (NPP .90) criteria. The item, if marked as occurring would positively predict depression. In contrast, if the item was marked as never occurring, it would negatively predict depression.

In conclusion, this study established base rates of behaviors on the Attention, Hyperactivity, and Depression scales of the TRS the BASC for adolescents with ADHD. The base rates were significantly different from scale to scale with those behaviors on the Attention scale being observed most often by teachers in the school setting. Low base rate numbers on the Depression scale suggest many of the behaviors on the scale are seldom observed by the teacher in the public school; however, when the items are observed, it is likely the student is depressed. Sensitivity rates indicated the items on the Hyperactivity and Depression scales of the TRS of the BASC were not characteristic of depression in students with ADHD, but the items on the Attention scale were characteristic of depressed students with ADHD. The Attention scale was unable to separate those who were depressed from those who were only inattentive. Specificity rates indicated the Depression scale items were specific to depression, whereas the

Attention and Hyperactivity scale items were not. None of the scales could positively predict depression, but all were highly likely to predict the absence of depression.

Implications for Theory

This investigation addressed: 1) the effectiveness of conditional probability analysis in research; 2) the comorbidity of ADHD and depression in adolescents; and 3) the ability of the Attention, Hyperactivity, and Depression scales of the teacher BASC to assist in identifying depression in students with ADHD. The effectiveness of conditional probability analysis was evident in this study. By using this procedure the usefulness of particular items and specific scales on assessment instruments can be validated. Items can be examined as to how often they occur within a population, how characteristic they are of a disorder, and how specific they are to a disorder. The information of PPP allows one to determine the most efficient inclusionary items for a disorder while the NPP rates allow for the ability to rule out the disorder. This is not to say that PPP or NPP rates are used in isolation to determine an identification of a disorder, but rather that they add additional information that assists school psychologists make more accurate and less biased decisions about disorders. Conditional probability analysis provides the school psychologist with an alternative method to be more efficient in predicting the likelihood of disorders in students.

Clearly comorbidity of ADHD and Depression was found to exist in this group of adolescents. Although the percentage of students was less than demonstrated in previous studies (Brumback & Weinberg, 1977; Cohen et al. 1993) the theory of comorbidity was supported. Although the theory was supported it was not as the author anticipated. The author expected to find the BASC identifying students with depression when in fact it

was the CDI that identified them. This is not a result of the items being different from one scale to another because they are very similar. Unlike Sandoval and Echandia, 1994, who reported "The BASC measures are state of the art for identifying children and adolescents with emotional disturbances and behavioral disorders and they deserve a place in every school and child psychologists test library" this author would tend to disagree when considering the Depression scale of the teacher form. Based on these results one would be more likely to identify an adolescent as depressed by giving a CDI or simply interviewing the adolescent.

Not only could the scale not positively predict depression it was not successful at predicting the absence of depression (NPP) even though the NPP rates were moderately high to highly likely. These rates strongly suggested depression could be ruled out, yet if one had, they would have missed 11 of the 13 students with depression.

Finally, the ratings on the Attention and Hyperactivity scales would not help a school psychologist identify students with depression. The authors of the BASC agree the depression subscale on the TRS for adolescents does not correlate highly with the Hyperactivity scale but does correlate with the TRS and PRS for children.

In summary, these results support the literature in the utilization of conditional probability analysis as an effective method for finding concrete data to support observations of behavior. Second, comorbidity does exist and it is important to recognize the complications associated with the condition. Finally, the TRS of the BASC specifically the subscales of Attention, Hyperactivity, and Depression are in general of little value in identifying students with ADHD and Depression.

Implications for School Psychologists

School psychologists are asked to observe behaviors and then make decisions

regarding the probability of a disorder/disability. The primary implication of this study

for school psychologists is the potential of conditional probability as a method for

accomplishing this difficult task. While the sensitivity and specificity rates identify items

that are characteristic or specific to a disorder, they cannot make predictions regarding

the likelihood of the presence or absence of a disorder. The PPP and NPP rates allow you

to predict the probability of a disorder rather than just associating hallmark symptoms

with a disorder.

A second important implication is found in the base rates. Milich et al. (1987)

addressed this issue of the importance of base rates when they reported: "The proportion

of ADD children who cannot sit still should not change even though the rate of ADD

children changes across settings, but the probability of ADD given the presence of

symptom "can't sit still" will be different depending on the base rates of the behavior and

the disorder." It is the belief of this investigator local base rates are advantageous

because diagnostic decisions are based on concrete data instead of clinical judgment

(Dawes, 1962, 1986). This information allows the school psychologist to have

information that is directly related to his/her population. As noted earlier, this provides

the school psychologist with information that lets you know how often to expect a teacher

to endorse an item on a scale. If the item has a low base rate it may be less useful

because you seldom observe it. In contrast, when it is observed, it will be noteworthy

and likely predict the presence of the disorder.

Finally, the third implication for school psychologists is the continued importance of an evaluation that uses multiple assessment tools to determine eligibility for special education services. If one were only to use the BASC to assess depression, the information would be inadequate to make a decision. School psychologists must make every effort to collect diagnostic information from teachers, parents, and students and then determine a pattern of behavior before making recommendations to multidisciplinary teams for placement.

Limitations of the Study

The limitations of this study have affected the generalizability of this study. The sample size was small. Students were identified through various methods (nurse's records and voluntary parental information), but only came from one suburban school district. Due to confidentiality laws, it may be unrealistic to expect to find a much larger sample within the public school setting.

Second, the investigator was unable to control for the method of diagnosis and the current medical treatment, as it was a public school and not a medical facility. Some students were medicated; others were not and the type of medication varied.

Third, some parents were unwilling to participate due to the sensitive nature of the study. They found the questions on both the BASC and the CDI to be invasive.

Fourth, the teachers who rated the students came from a variety of educational backgrounds (regular vs. special education) and levels of teaching experience (one to thirty years).

Fifth, the variance in the relationships the teachers had with the students may have impacted their ratings. Some had known the students they rated for as long as four years while others had only known them for a semester.

Future Research

The results of this study suggest future research may be warranted in the following areas:

1. Analysis of another behavioral assessment tool may prove to be successful in positively predicting depression in adolescents with ADHD.

2. A comparison of various informants (teacher, parent, and student) could be examined to determine if similar results are obtained.

3. An attempt to control medical interventions could result in a more specific pattern of results.

REFERENCES

Accardo, P. J., Blondis, T. A., & Whitman, B.Y. (1990). Disorders of attention and activity level in a referral population. Pediatrics, 85, 426-431.

Achenbach, T. M., & Edelbrock, C. (1983). Manual for the Child Behavior Checklist and Revised Child Behavior Profile. Burlington, VT: University of Vermont. Department of Psychiatry.

Allen-Meares P. (1987). Depression in childhood and adolescence. Social Work, 32, 512-516.

American Psychiatric Association. (1968). Diagnostic and statistical manual of mental disorders. (2nd ed.). Washington, DC: Author.

American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders. (3rd ed.). Washington, DC: Author.

American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders. (3rd ed. Rev.). Washington, DC: Author.

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders. (4th ed.). Washington, DC: Author.

Anderson, J. C., Williams, S., McGee, R., & Silva, P. A. (1987). DSM-III disorders in preadolescent children: Prevalence in a large sample from the general population. Archives of General Psychiatry, 44, 69-76.

Angold, A. (1988). Childhood and adolescent depression II: Research in clinical populations. British Journal of Psychiatry, 153, 476-492.

Attention Deficit Disorders. (1991, June). Florida School Psychologist,18, (2).

Barkley, R. A. (1989). Attention Deficit Disorder with Hyperactivity. In E. J. Mash & R. A. Barkley (Eds). Treatment of childhood disorders. (2nd ed.) (pp. 39-72). New York, NY: Guilford Press.

Barkley, R. A. (1990). Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment. New York, NY: Guilford Press.

Barkley, R. A. & Ullman, D.G. (1975). A comparison of objective measures of activity and distractibility in hyperactive and nonhyperactive children. Journal of Abnormal Child Psychology, 3, 213-244.

Barrickman, L. L., Perry, P. J., Allen, A. J., Kuperman, S., Arndt, S. V., Herrmann, K. J., & E. Schumacher. (1995). Bupropion versus methlyphenidate in the treatment of attention-deficit hyperactivity disorder. Journal of the American Academy of Child and Adolescent Psychiatry, 34, (5), 649-657.

Bell-Dolan, D. J., Last, C. G., & Strauss, C. C. (1990). Symptoms of anxiety disorders in normal children. Journal of the American Academy of Child and Adolescent Psychiatry, 29, 759-765.

Berry, C. S., Shaywitz, S. E., & Shaywitz, B. A. (1985). Girls with attention deficit disorder: A silent minority? A report on behavioral and cognitive characteristics. Pediatrics, 76, (5), 801-809.

Best, J. (1992). Cognitive psychology. (3rd ed.). St. Paul, MN: West Publishing Co.

Biederman, J., Faraone, S. V., Keenan, K., Knee, D., & Tsuang, M. T. (1990). Family-genetic and psychosocial risk factors in DSM-III attention deficit disorder. Journal of the American Academy of Child and Adolescent Psychiatry, 29, 526-533.

Biederman, J., Newcorn, J., & Sprich, S. (1991). Comorbidity of attention deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders. American Journal of Psychiatry, 148, 564-577.

Biederman, J., & Steingard, R. (1989). Attention-Deficit Hyperactivity Disorder in Adolescents. Psychiatric Annals, 19, (11), 587-596.

Birmacher, B., Williamson, D. E., Brent, D. A., Kaufman, J., Dahl, R. E., Perel, J., & Nelson, B. (1996). Childhood and adolescent depression: A review of the past 10 years. Journal of the American Academy of Child and Adolescent Psychiatry, 35, (11), 1427-1450.

Borchardt, C. M., & Bernstein, G. A. (1995). Comorbid disorders in hospitalized bipolar adolescents compared with unipolar depressed adolescents. Child Psychiatry and Human Development, 26, 11-18.

Breslau, N., Schultz, L., & Peterson, E. (1995). Sex differences in depression: A role for preexisting anxiety. Psychiatry Research, 58, 1-12.

Brown, D. T. (1995). Reviews and critiques of school psychology materials. Journal of School Psychology, 33, 177-186.

Brown, R. T., & Quay, L. C. (1977). Reflection-impulsivity of normal and behavior-disordered children. Journal of Abnormal Child Psychology, 5, 457-462.

Brumback, R. A., & Weinberg, W. A. (1977). Relationship of hyperactivity and depression in children. Perceptual & Motor Skills, 45, 247-251.

Cantwell, D. (1972). Psychiatric illness in the families of hyperactive children. Archives of General Psychiatry, 27, 414-417.

Carlson, G. A., & Kashani, J. H. (1988). Phenomenology of major depression from childhood through adulthood: Analysis of three studies. American Journal of Psychiatry, 145, 1222-1225.

Cherkes-Julkowski, M., Sharp, S., & Stolzenberg, J. (1997). Rethinking attention deficit disorders. Massachusetts: Brookline Books.

Cohen, P., Cohen, J., Kasen, S., Velez, C. N., Hartmark, C., Johnson, J., Rojas, M., Brook, J., & Streunign, E. L. (1993). An epidemiological study of disorders in late childhood and adolescence-I age and gender-specific prevalence. Journal of Child Psychology & Psychiatry and Allied Disciplines, 34, 851-867.

Cooley, E. L., & Morris, R. D. (1990). Attention in children: A Neuropsychologically based model for assessment. Developmental Neuropsychology, 6, 239-274.

Cullinan, D., Schloss, P. J., & Epstein, M. H. (1987). Relative prevalence and correlates of depressive characteristics among seriously emotionally disturbed and non-handicapped students. Behavioral Disorders. (pp.90-98).

Cytryn, L., & McKnew D. H. (1972). Proposed classification of childhood depression. American Journal of Psychiatry, 120, 149-155.

Cytryn, L., & McKnew D. H. (1996). Growing up sad. New York, NY: W.W. Norton & Company.

Dawes, R. M. (1962). A note on base rates and psychometric efficiency. Journal of Consulting Psychology, 26, 422-424.

Dawes, R. M. (1986). Representative thinking in clinical judgment. Clinical Psychology-Review, 6, 425-441.

deMesquita, P. B., & Gilliam, W. S. (1994). Differential diagnosis of childhood depression: Using comorbidity and symptom overlap to generate multiple hypotheses. Child Psychiatry and Human Development, 24, 157-172.

Diller, L. H. (1996). The run on Ritalin: Attention deficit disorder and stimulant treatment in the 1990's. Hastings Center Report, 26, (2), 12-18.

Douglas, V. I. (1972). Stop, look, and listen: The problem of sustained attention and impulse control in hyperactive and normal children. Canadian Journal of Behavioural Science, 4, 259-282.

Feingold, B. (1975). Why your child is hyperactive. New York, NY: Random House.

Gabrielle, A., Carlson, M. D., & Kashani, J. H. (1988). Phenomenology of major depression from childhood through adulthood: Analysis of three studies. American Journal of Psychiatry, 145, 1222-1225.

Gammon, G. D., & Brown, T. E. (1993). Fluoxetine and methlyphenidate in combination for treatment of attention deficit disorder and comorbid depressive disorder. Journal of Child and Adolescent Psychopharmacology, 3 (1), 1-10.

Goldstein, S., & Goldstein, M. (1990). Managing attention disorders in children: A guide for practitioners. New York, NY: John Wiley & Sons.

Goodman, R., & Stevenson, J. (1989). A twin study of hyperactivity. II. The aetiological role of genes, family relationships and perinatal adversity. Journal of Child Psychology and Psychiatry, 30, 691-709.

Gordon, M. (1979). The assessment of impulsivity and mediating behaviors in hyperactive and non-hyperactive children. Journal of Abnormal Child Psychology, 7, 317-326.

Hays, W. L. (1988). Statistics. Fort Worth, TX: Holt, Rinehart, & Winston.

Jacob, R. G., O'Leary, K. D., & Rosenblad, C. (1978). Formal and informal classroom settings: Effects on hyperactivity. Journal of Abnormal Child Psychology, 6, 47-59.

Jacobvitz, D., Sroufe, L. A., Stewart, M., & Leffert, N. (1990). Treatment of attentional and hyperactivity problems in children with sympathomimetic drugs: A comprehensive review. The American Academy of Child and Adolescent Psychiatry, 29 (5), 677-688.

Jensen, J. B., Burke, N., & Garfinkel, B. D. (1988). Depression and symptoms of attention deficit disorder with hyperactivity. Journal of American Academy of Child and Adolescent Psychiatry, 27, 742-747.

Jensen, P. S., Koretz, D., Locke, B. Z., Schneider, S., Radke-Yarrow, M., Richters, J. E., & Rumsey, J. M. (1993). Child and adolescent psychopathology research: Problems & prospects for the 1990s. Journal of Abnormal Child Psychology, 21 (5), 551-580.

Kaplan, C. P., & Shachter, E. (1993). Diagnostic and treatment issues with childhood bipolar disorders. Clinical Social Work Journal, 21, 271-281.

Kashani, J. H., Carlson, G. A., Beck, N. C., Hoeper, E. W., Corcoran, C. M., McAllister, J. A., Fallahi, C., Rosenberg, T. K., & Reid, J. C. (1987). Depression, depressive symptoms, and depressed mood among a community sample of adolescents. American Journal of Psychiatry, 144, 931-934.

Kaslow, N. J., Rehn, L. P., & Siegel, A. W. (1984). Social-cognitive and cognitive correlates of depression in children. Journal of Abnormal Child Psychology, 12, 605-620.

Kavan, M. G. (1992). Review of the Children's Depression Inventory. The Eleventh Mental Measurements Yearbook. (pp. 174-175).

Kirk, S. S., Gallagher, J. J., & Anastasiow, N. J. (1993). Educating Exceptional Children. Boston, MA: Houghton Mifflin Co.

Kolvin, I., Barrett, M. L., Bhate, S. R, Berney, T. P. Famuyiwa, O. O., Fundudis, T., & Tyrer, S. (1991). The Newcastle child depression project diagnosis and classification of depression. British Journal of Psychiatry, 159, 9-21.

Kovacs, M. (1982). The longitudinal study of child and adolescent psychopathology I. The semi-structured psychiatric interview schedule for children (ISC). Archives of General Psychiatry, 34, 223-226.

Kovacs, M. (1983). Definition and assessment of childhood depressions. In: Ricks, D. F., Dohrenwend, B. S. Origins of psychopathology: Problems in research and public policy. Cambridge University Press New York, NY.

Kovacs, M. (1989). Affective disorders in children and adolescents. American Psychologist. (pp. 209-215).

Kovacs, M. (1992). Children's Depression Inventory. Multiple Systems, Inc.

Kovacs, M., & Beck, A. T. (1977). An empirical-clinical approach towards a definition of child depression. Depression in childhood: Diagnosis, research and conceptual models, (Eds J. G. Schulterbrandt & A. Raskin). New York, NY: Raven Press.

Lahey, B. B., Applegate, B., McBurnett, K., Biederman, J., Greenhill, L., Hynd, G. W., Barkley, R. A., Newcorn, J., Jensen, P., Richters, J., Garfinkel, B., Kerdyk, L., Frick, P. J., Ollendick, T., Perez, D., Hart, E. L., Waldman, I., & Shaffer, D. (1994). DSM-IV field trials for attention deficit hyperactivity disorder in children and adolescents. American Journal of Psychiatry, 151 (11), 1673-1685.

Laurent, J., Landau, S., & Stark, K. D. (1993). Conditional probabilities in the diagnosis of depressive and anxiety disorders in children. School Psychology Review, 22, 98-114.

Lesse, S. (1983). Masked depression. Current Psychiatric Therapy, 22, 81-87.

Lewinsohn, P. M., Rohde, P., Seeley, J. R. & Hops, H. (1991). Comorbidity of unipolar depression: I. Major depression with dysthymia. Journal of Abnormal Psychology, 100, 205-213.

Linnoila, V. I. & Virkkunen, M. (1992). Aggression, suicidality and serotonin. Journal of Clinical Psychiatry, 53 (Suppl.), 46-51.

Luk, Siu-luen. (1985). Direct observation studies of hyperactive behaviors. Journal of the American Academy of Child Psychiatry, 24, 338-344.

Milich, R., Widiger, T. A., & Landau, S. (1987). Differential diagnosis of attention deficit and conduct disorders using conditional probabilities. Journal of Consulting and Clinical Psychology, 55, 762-767.

Pelham, W. E., Evans, S. W., Gnagy, E. M., & Greenslade, K. E. (1992). Teacher ratings of DSM-III-R symptoms for the disruptive behavior disorders: Prevalence, factor analyses, and conditional probabilities in a special education sample. School Psychology Review, 21, 285-299.

Rapport, M. D., Tucker, S. B., DuPaul, G. J., Merlo, M., & Stoner, G. (1986). Hyperactivity and frustration: The influence of control over and size of rewards in delaying gratification. Journal of Abnormal Child Psychology, 14, 191-204.

Reinherz, H. Z., Stewart-Berghauer, G., Pakiz, B., & Frost, A. (1989). The relationship of early risk and current mediators to depressive symptomatology in adolescence. Journal of the American Academy of Child & Adolescent Psychiatry, 28, 942-947.

Reynolds, C. R., & Kamphaus, R. W. (1990). Handbook of psychological and educational assessment of children personality, behavior, and context.

Reynolds, C. R., & Kamphaus, R. W. (1992). Behavior assessment system for children manual. (pp. 48).

Routh, D. K., & Schroeder, C. S. (1976). Standardized playroom measures as indices of hyperactivity. Journal of Abnormal Child Psychology, 4, 199-207.

Ryan, N. D., Puig-Antich, J., Ambrosini, P., Rabinovich, H., Robinson, D., Nelson, B., Iyengar, S., & Twomey, J. (1987). The clinical picture of major depression in children and adolescents. Archives of General Psychiatry, 44, 854-861.

Saylor, C. F., Finch, A. J., Spirito, A., & Bennett, B. (1984). The children's depression inventory: a systematic evaluation of psychometric properties. Journal of Consulting Clinical Psychology, 52, 955-967.

Stark, K. D. (1990). Childhood depression: School-based interventions. New York, NY: Guilford Press.

Staton, R. D., & Brumback, R. A. (1981). Non-specificity of motor hyperactivity as a diagnostic criterion. Perceptual and Motor Skills, 52, 323-332.

Stewart, M. A., & Olds, S. (1973). Raising a hyperactive child. New York, NY: Harper & Row.

Swartz, S. L., & Benjamin, C. (1980). Childhood depression and hyperactivity. Paper presented at Annual Conference on Severe Behavior Disorders of Children and Youth.

Voeller, K. K. (1991). What can neurological models of attention, intention, and arousal tell us about Attention-Deficit Hyperactivity Disorder? Journal of Neuropsychiatry and Clinical Neuroscience, 3, 209-216.

Weinberg, S. L., & Goldberg, K. P. (1990). Statistics for the behavioral sciences. Cambridge, MA: Cambridge University Press.

Weinberg, W. A., & Emslie, G. J. (1991). Attention deficit hyperactivity disorder: The differential diagnosis. Journal of Child Neurology, 6, 523-536.

Weinberg, W. A., McClean, A., Snider, R. L., Nuckols, A. S., Rintelmann, J. W., Erwin, P. R., & Brumback, R. A. (1989). Psychological Reports, 64, 275-283.

Weller, E. B., Weller, R. A., & Fristad, M. A. (1995). Bipolar disorder in children: Misdiagnosis, underdiagnosis, and future directions. Journal of American Academy of Child and Adolescent Psychiatry, 34, 7709-7714,

West, S. A., McElroy, S. L., Strakowski, S. M., Keck, P. E., Jr., & McConville, B. J. (1995). Attention deficit hyperactivity disorder in adolescent mania. American Journal of Psychiatry, 152 (2), 271-273.

Willerman, L. (1973). Activity level and hyperactivity in twins. Child Development, 44, 288-293.

Williams-White, S. C. (1992). The association of attention processes and internalizing and externalizing symptoms among inpatient boys. (Doctoral dissertation, Miami University, 1992). Dissertation Abstracts International, AAT9235687.

Zametkin, A. J., Nordahl, T. E., Gross, M., & King, A. C. (1990). Cerebral glucose metabolism in adults with hyperactivity of childhood onset. <u>New England Journal of Medicine, 323,</u> 1361-1366.

Zentall, R. D., & Hayes, S. C. (1983). Rule-governed behavior: A potential theoretical framework for cognitive-behavioral therapy. In P. C. Kendall (Ed.), <u>Advances in cognitive-behavioral research, 1</u> (pp. 73-118). New York, NY: Academic Press.

Zentall, S. S. (1985). A context for hyperactivity. In K. D. Gadow & I. Bialer (Eds.), <u>Advances in learning and behavioral disabilities, 4,</u> 273-343. Greenwich, CT: JAI Press.

APPENDIXES

APPENDIX A

DIAGNOSTIC CRITERIA FOR ATTENTION-

DEFICIT/HYPERACTIVITY DISORDER

DIAGNOSTIC CRITERIA FOR ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

A. Either (1) or (2):

(1) Six (or more) of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

Inattention

    (a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities

    (b) often has difficulty sustaining attention in tasks or play activities

    (c) often does not seem to listen when spoken to directly

    (d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)

    (e) often has difficulty organizing tasks and activities

    (f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)

    (g) often loses things necessary for tasks or activities (e.g. toys, school assignments, pencils, books, or tools)

    (h) is often easily distracted by extraneous stimuli

    (i) is often forgetful in daily activities

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

Hyperactivity

    (a) often fidgets with hands or feet or squirms in seat

    (b) often leaves seat in classroom or in other situations in which remaining seated is expected

(c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)

(d) often has difficulty playing or engaging in leisure activities quietly

(e) is often "on the go" or often acts as if "driven by a motor"

(f) often talks excessively

Impulsivity

(g) often blurts out answers before questions have been completed

(h) often has difficulty awaiting turn

(i) often interrupts or intrudes on others (e.g., butts into conversations or games)

B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.

C. Some impairment from the symptoms is present in two or more settings (e.g., at school, work, and at home).

D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning (DSM IV, 1994).

APPENDIX B

DIAGNOSTIC CRITERIA FOR MAJOR

DEPRESSIVE EPISODE

DIAGNOSTIC CRITERIA FOR MAJOR

DEPRESSIVE EPISODE

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning: at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.

Note: Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.

    (1) Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). Note: In children and adolescents, can be irritable mood.

    (2) Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by other).

    (3) Significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. Note: In children, consider failure to make expected weight gains.

    (4) Insomnia or hypersomnia nearly every day.

    (5) Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).

    (6) Fatigue or loss of energy nearly every day.

    (7) Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).

    (8) Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).

    (9) Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt, or a specific plan for committing suicide.

B. The symptoms do not meet criteria for a Mixed Episode (see p. 335).

C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).

E. The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

APPENDIX C

DIAGNOSTIC CRITERIA FOR

MANIC EPISODE

DIAGNOSTIC CRITERIA FOR MANIC EPISODE

A. A distinct period of abnormally and persistently elevated, expansive, or irritable mood, lasting at least 1 week (or any duration if hospitalization is necessary).

B. During the period of mood disturbance, three (or more) of the following symptoms have persisted (four if the mood is only irritable) and have been present to a significant degree:

(1) inflated self-esteem or grandiosity

(2) decreased need for sleep (e.g., feels rested after only 3 hours of sleep)

(3) more talkative than usual or pressure to keep talking

(4) flight of ideas or subjective experience that thoughts are racing

(5) distractibility (i.e., attention too easily drawn to unimportant or irrelevant external stimuli)

(6) increase in goal-directed activity (either socially, at work or school, or sexually) or psychomotor agitation

(7) excessive involvement in pleasurable activities that have a high potential for painful consequences (e.g., engaging in unrestrained buying sprees, sexual indiscretions, or foolish business investments)

(8) The symptoms do not meet criteria for a Mixed Episode (see p. 335).

C. The mood disturbance is sufficiently severe to cause marked impairment in occupational functioning or in usual social activities or relationships with others, or to necessitate hospitalization to prevent harm to self or others, or there are psychotic features.

D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication, or other treatment) or a general medical condition (e.g., hyperthyroidism).

Note: Manic-like episodes that are clearly caused by somatic antidepressant treatment (e.g., medication, electroconvulsive therapy, light therapy) should not count toward a diagnosis of Bipolar I Disorder.

APPENDIX D

DIAGNOSTIC CRITERIA FOR

MIXED EPISODE

DIAGNOSTIC CRITERIA FOR MIXED EPISODE

A. The criteria are met both for a Manic Episode (see p. 332) and for a Major Depressive Episode (see p. 327) (except for duration) nearly every day during at least a 1-week period.

B. The mood disturbance is sufficiently severe to cause marked impairment in occupational functioning or in usual social activities or relationships with others, or to necessitate hospitalization to prevent harm to self or others, or there are psychotic features.

C. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication, or other treatment) or a general medical condition (e.g., hyperthyroidism).

Note: Mixed-like episodes that are clearly caused by somatic antidepressant treatment (e.g., medication, electroconvulsive therapy, light therapy) should not count toward a diagnosis of Bipolar I Disorder

APPENDIX E

DIAGNOSTIC CRITERIA FOR

HYPOMANIC EPISODE

DIAGNOSTIC CRITERIA FOR HYPOMANIC EPISODE

A. A distinct period of persistently elevated, expansive, or irritable mood, lasting throughout at least 4 days, that is clearly different from the usual nondepressed mood.

B. During the period of mood disturbance, three (or more) of the following symptoms have persisted (four if the mood is only irritable) and have been present to a significant degree:

(1) inflated self-esteem or grandiosity

(2) decreased need for sleep (e.g., feels rested after only 3 hours of sleep)

(3) more talkative than usual or pressure to keep talking

(4) flight of ideas or subjective experience that thoughts are racing

(5) distractibility (i.e., attention too easily drawn to unimportant or irrelevant external stimuli)

(6) increase in goal-directed activity (either socially, at work or school, or sexually) or psychomotor agitation

(7) excessive involvement in pleasurable activities that have a high potential for painful consequences (e.g., the person engages in unrestrained buying sprees, sexual indiscretions, or foolish business investments)

C. The episode is associated with an unequivocal change in functioning that is uncharacteristic of the person when not symptomatic.

D. The disturbance in mood and the change in functioning are observable by others.

E. The episode is not severe enough to cause marked impairment in social or occupational functioning, or to necessitate hospitalization, and there are no psychotic features.

F. The symptoms are not due to the direct physiological effects of subtonic (e.g., a drug of abuse, a medication, or other treatment) or a general medical condition (e.g., hyperthyroidism).

Note: Hypomanic-like episodes that are clearly caused by somatic antidepressant treatment (e.g., medication, electroconvulsive therapy, light therapy) should not count toward a diagnosis of Bipolar II Disorder.

APPENDIX F

DIAGNOSTIC CRITERIA FOR

DYSTHMIC DISORDER

DIAGNOSTIC CRITERIA FOR DYSTHMIC DISORDER

A. Depressed mood for most of the day, for more days than not, as indicated either by subjective account or observation by other, for at least 2 years. Note: In children and adolescents, mood can be irritable and duration must be at least 1 year.

B. Presence, while depressed, of two (or more) of the following:

    (1) poor appetite or overeating

    (2) insomnia or hypersomnia

    (3) low energy or fatigue

    (4) low self-esteem

    (5) poor concentration or difficulty making decision

    (6) feelings of hopelessness

C. During the 2-year period(1 year for children or adolescents) of the disturbance, the person has never been without the symptoms in Criteria A and B for more than 2 months at a time.

D. No Major Depressive Episode (see p. 327) has been present during the first 2 years of the disturbance (1 year for children and adolescents); i.e., the disturbance is not better accounted for by chronic Major Depressive Disorder, or Major Depressive Disorder. In Partial Remission.

Note: There may have been a previous Major Depressive Episode provided there was a full remission (no significant signs or symptoms for 2 months) before development of the Dysthymic Disorder. In addition, after the initial 2 years (1 year in children or adolescents) of Dysthymic Disorder, there may be superimposed episodes of Major Depressive Disorder, in which case both diagnoses may be given when the criteria are met for a Major Depressive Episode.

E. There has never been a Manic Episode (see p. 332), a Mixed Episode (see p. 335), or a Hypomanic Episode (see p. 338), and criteria have never been met for Cyclothymic Disorder.

F. The disturbance does not occur exclusively during the course of a chronic Psychotic Disorder, such as Schizophrenia or Delusional Disorder.

G. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).

H. The symptoms cause clinically significant distress or impairment in social, occupation, or other important areas of functioning.

Specify if:
    Early Onset: If onset is before age 21 years
    Late Onset: if onset is age 21 years or older

Specify (for most recent 2 years of Dysthymic Disorder):
    With Atypical Features (see p. 384)

APPENDIX G

OKLAHOMA STATE UNIVERSITY INSTITUTIONAL

REVIEW BOARD APPROVAL OF

HUMAN SUBJECTS STUDY

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 10-09-96   IRB#: ED-97-011

Proposal Title: **DEPRESSION LEVELS IN ADHD, SED, AND REGULAR EDUCATION STUDENTS.**

Principal Investigator(s): Judy Oehler-Stinnett, Nancy Faye Barton

Reviewed and Processed as: Full Board

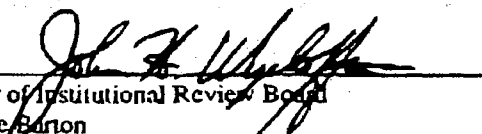Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING. AS WELL AS ARE SUBJECT TO MONITORING AT ANY TIME DURING THE APPROVAL PERIOD.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

Signature: _____   Date: November 15, 1996
         Chair of Institutional Review Board
cc: Nancy Faye Barton

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 05-11-98   IRB #: ED-98-107

Proposal Title: DEPRESSION LEVELS IN ATTENTION DEFICIT HYPERACTIVITY
DISORDERED AND REGULAR EDUCATION STUDENTS

Principal Investigator(s): Judy Oehler-Stinnett, Nancy F. Barton

Reviewed and Processed as: Expedited with Special Population

Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT
NEXT MEETING, AS WELL AS ARE SUBJECT TO MONITORING AT ANY TIME DURING THE
APPROVAL PERIOD.
APPROVAL STATUS PERIOD VALID FOR DATA COLLECTION FOR A ONE CALENDAR YEAR
PERIOD AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE
SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Disapproval are as follows:

Signature Thomas C. Collins   Date: June 19, 1998

Interim Chair of Institutional Review Board
cc: Nancy F. Barton

3238 East 93rd Street
Tulsa, OK 74137

March 11, 1999

Oklahoma State University
Institutional Review Board
Human Subjects Review

RE: IRB #: ED-09-107

At the request of my doctoral committee the title of my doctorate thesis has been changed to Depression in Adolescents With Attention Deficit Hyperactivity Disorder: Using Conditional Probabilities Based on Teacher Ratings From The Behavior Assessment System For Children. The new title describes the thesis more accurately and is clearer to understand. Please note this change in my permanent file. Thank you.

Sincerely,

Nancy Faye Barton

APPENDIX H

PARENT/GUARDIAN INFORMED

CONSENT FORM A

PARENT/GUARDIAN INFORMED CONSENT

FORM A

In the past, your teenager was evaluated for special education. At that time behavior rating scales were completed. These forms are now kept in your teenager's confidential folder. I would like to have access to that information for the purpose of research. Specifically, I am interested in studying teenagers with Attention Deficit Hyperactive Disorder (ADHD). In addition, I would like you to complete an ADHD behavioral checklist on your student and a personal data information form. In order for you to decide whether or not you should agree to participate in this research study you should understand enough about its risks and benefits to make a judgment. This process is called informed consent.

Once I have explained the study and you understand it, you will be asked to sign this form if you wish for your teenager to participate. You will be given a copy for your records.

The purpose of this study is to determine the social/emotional levels of students with ADHD. The results of this study may help professionals be more effective in their work with this type of student. The information I will use from your teenager's confidential records will be the rating scales completed by the parent, teachers, and student. These scales asked questions about the behavior of your student in regards to social/emotional issues. These rating scales are commonly used in the Jenks Public School system for evaluations for special education.

The additional forms I will ask you to complete will take 10-15 minutes to answer. These forms are not used in the school system but are important for research purposes. The first form is a checklist that is commonly used by medical doctors to determine the existence of Attention Deficit Disorder. The personal data information form will be used to identify the family background of the students.

It is important you understand that:

1. Your decision to allow the participation of your teenager in this study is voluntary.

2. As the parent/guardian of this student you may withdraw your consent at any time without explanation.

3. All of the information collected will be held as confidential and will be coded in order to keep identification of any of the participants anonymous. You have the right to choose not to respond to questions on the additional forms (checklist and personal data information form).

4. If you have any questions about the study I can be reached at 299-4411. In addition, you may contact Ms. Gay Clarkson, IRB Executive Secretary at Oklahoma State University (405) 744-5700. She will be happy to answer any questions or concerns you might have. Her address is 305 Whitehurst Hall, Oklahoma State University, Stillwater, Oklahoma 74078-0075.

Please indicate below if you would like the results of the study. I will be happy to send them to you.

I give my consent for Nancy Barton to have access to my teenager's confidential records for research purposes only. In addition, I will complete an ADHD Behavioral Checklist and a Personal Data Information form on my child.

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

Signature _____ Parent or Guardian?

I would like a copy of the results of this project. Yes _____ No _____

I have explained this form to the parent/guardian before requesting his/her signature. A copy has been given to the parent/guardian.

Signature _____
                Nancy Barton

APPENDIX I

PARENT/GUARDIAN INFORMED

CONSENT FORM B

PARENT/GUARDIAN INFORMED CONSENT

FORM B

I would like to ask your permission to allow your teenager to participate in a research study I am conducting with teenagers who are identified as Attention Deficit Hyperactive Disorder (ADHD). In order for you to decide whether or not you should agree to participate in this research study you should understand enough about its risks and benefits to make a judgment. This process is called informed consent.

Once I have explained the study and you understand it, you will be asked to sign this form if you wish for your teenager to participate. You will be given a copy for your records.

The purpose of this study is to determine the social/emotional levels of students with ADHD. The results of this study may help professionals be more effective in their work with teenagers diagnosed with ADHD.

There are three things I need to ask of you.

First, I would like permission to have your teenager fill out a form that asks 27 questions about social and emotional issues. This should take your child approximately 10 minutes to complete. I will have your teenager complete this form during times when they are not involved in schoolwork.

Second, I would like your views on your teenager. You will need to complete two forms that will take 10-20 minutes. The first form is an ADHD Behavioral Checklist commonly asked by medical doctors to help determine the diagnosis of ADHD. The second form is a general personal data form that will identify the background of the students participating in the study.

Third, I would like one of your teenager's teachers to be able to fill out a behavior rating scale and checklist of behaviors. The first form will ask social/emotional questions about your son/daughter with an emphasis in the school setting. The second form is the ADHD checklist of behaviors the same as you completed.

It is important you understand that:

1. Your decision to allow the participation of your student in this study is voluntary. You have the right to choose not to respond to questions on the forms.

2. Your teenager's decision to participate in this study is voluntary. They have the right to not respond to questions on the form.

3. As the parent/guardian of this teenager you may withdraw your consent at any time without explanation.

4. Your teenager may withdraw from the study at any time without explanation.

5. All of the information collected will be held as confidential and will be coded in order to keep identification of any of the participants anonymous.

6. If you have any questions about the study, I can be reached at 299-4411. In addition, you may contact Ms. Gay Clarkson, IRB Executive Secretary at Oklahoma State University (405) 744-5700. She will be happy to answer any questions or concerns you might have. Her address is 305 Whitehurst Hall, Oklahoma State University, Stillwater, Oklahoma 74078-0075.

Please indicate below if you would like the results of the study. I will be happy to send them to you.

I give my consent for my teenager to participate in research conducted by Nancy Barton, school psychologist at Jenks Public Schools. I am aware that one of my teenager's teachers will be asked to complete a rating scale and a checklist. My teenager will be asked to complete an inventory. In addition, I will complete an ADHD checklist (if appropriate for my student) and a personal data information form.

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

Signature _____ Parent or Guardian?

I would like a copy of the results of this project. Yes _____ No _____

I have explained this form to the parent/guardian before requesting his/her signature. A copy has been given to the parent/guardian.

Signature _____
          Nancy Barton

APPENDIX J

PERSONAL DATA INFORMATION FORM

PERSONAL DATA INFORMATION

STUDENT INFORMATION   Date_____

1. Student name_____

2. Date of birth_____   3. Age_____

4. Sex: 1] female____ 2] male____

5. Race: 1] White ____   2] African-American____ 3] Native American_____
           4] Hispanic____   5] Asian American____   6] Other_____

6. Was the child a full term pregnancy? 1] yes ____ 2] no____
    If "no", please specify how premature the child was at birth
    _____

7. Were there any complications at birth? 1] yes____ 2] no____
    If "yes", please explain._____
    _____

8. Was the child adopted? 1] yes____ 2] no____   If "yes", at what age _____

9. Is the child taking any medications at this time? 1] yes____ 2] no____
    If "yes", give reasons_____

10. Are there any medications the child has taken in the past, but is not taking at the
    present time? 1] yes____ 2] no____
    If "yes" please give reasons:_____

PARENTS/ PARENT/ GUARDIAN INFORMATION

1. Marital status: 1] married____ 2] separated_____   3] divorced____
                    4] single____

2. Race: 1] White____   2] African American____ 3] Native American ____
                 4] Hispanic____ 5] Asian American____   6] Other____

3. Education: 1] Eighth grade completion____ 2] High school diploma___
                 3] Some college____   4] College degree____

4. Average Income: 1] $10,000-20,000____ 2] $20,000-30,000___
                3] $30,000-40,000____ 4] $40,000-50,000____ 5] $50,000 or more____

5. Occupation:_____

APPENDIX K

ADHD BEHAVIORAL CHECKLIST

ADHD BEHAVIORAL CHECKLIST

Student's name _____ Date of birth_____
Rater's name _____ Date checklist completed _____
Rater's relation to Student _____
Please check those behaviors below that apply to your child before h/she was on
medication for attention deficit disorder. Check only those behaviors that have persisted
for at least 6 months and were severe enough to be considered inappropriate for his/her
developmental level.

_____ 1. often fails to give close attention to details or makes careless mistakes in
schoolwork, work, or other activities

_____ 2. often has difficulty sustaining attention in tasks or play activities

_____ 3. often does not seem to listen when spoken to directly

_____ 4. often does not follow through on instructions and fails to finish
schoolwork, chores, or duties in the workplace (not due to oppositional
behavior or failure to understand instructions)

_____ 5. often has difficulty organizing tasks and activities

_____ 6. often voids, dislikes, or is reluctant to engage in tasks that require
sustained mental effort (such as schoolwork, or homework)

_____ 7. often loses things necessary for tasks or activities (e.g., toys, school
assignments, pencils, books, or tools)

_____ 8. is often easily distracted by extraneous stimuli

_____ 9. is often forgetful in daily activities

_____ 10. often fidgets with hands or feet or squirms in seat

_____ 11. often leaves seat in classroom or in other situations in which remaining
seated is expected

_____ 12. often runs about or climbs excessively in situations in which it is
inappropriate (in adolescents may be limited to subjective feelings of
restlessness)

_____ 13. often has difficulty playing or engaging in leisure activities quietly

_____ 14. is often "on the go" or often acts as if "driven by a motor"

_____ 15. often talks excessively

_____ 16. often blurts out answers before questions have been completed

_____ 17. often has difficulty awaiting turn

_____ 18. often interrupts or intrudes on others (e.g. butts into conversations or
games)

The behaviors checked above were present before age 7 years ____ yes _____ no
The behaviors checked above are present in two or more home) ___yes _____no

American Psychiatric Association. (1994). Diagnostic and statistical manual of
mental disorders (4th settings (e.g., at school and at ed.). Washington, DC: Author.

APPENDIX L

STUDENT INFORMED ASSENT FORM

STUDENT INFORMED ASSENT FORM

I would like to ask your permission to participate in a research study I am conducting with teenagers who are identified as Attention Deficit Hyperactive Disorder (ADHD). In order for you to decide whether or not you should agree to participate in this research study, you should understand enough about its risks and benefits to make a judgment. This process is called informed consent.

Once I have explained the study and you understand it, you will be asked to sign this form if you wish to participate. You will be given a copy for your records.

The purpose of this study is to determine the social/emotional levels of students with ADHD. The results of this study may help professionals be more effective in their work with students diagnosed with ADHD.

It is important you understand that:

1. Your decision to participate in this study is voluntary. You have the right to choose not to respond to questions on the forms.

2. All of the information collected will be held as confidential and will be coded in order to keep your identification anonymous. The results of this information will not affect your grades, be given to your teachers, or be given to your parents. The only exception to confidentiality would be if you were to indicate an intention to harm yourself or someone else. In that case, I am obligated to initiate a crisis intervention meeting at your school.

3. If you have any questions about the study, I can be reached at 299-4411. In addition, you may contact Ms. Gay Clarkson, IRB Executive Secretary at Oklahoma State University (405) 744-5700. She will be happy to answer any questions or concerns you might have. Her address is 305 Whitehurst Hall, Oklahoma State University, Stillwater, Oklahoma 74078-0075.

Please indicate below if you would like the results of the study. I will be happy to send them to you.

I give my assent to participate in research conducted by Nancy Barton, school psychologist at Jenks Public Schools. I am aware that I will be asked to complete a rating scale.

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

Signature_____

I would like a copy of the results of this project. Yes _____ No _____

I have explained this form to the parent/guardian before requesting his/her signature. A copy has been given to the parent/guardian.

Signature _____
                Nancy Barton

APPENDIX M

TEACHER INFORMED CONSENT FORM

TEACHER INFORMED CONSENT

I would like to ask your consent to participate in a research study I am conducting with teenagers who are identified as students with Attention Deficit Hyperactive Disorder (ADHD). In order for you to decide whether or not you should agree to participate in this research study you should understand enough about its risks and benefits to make a judgment. This process is called informed consent.

Once I have explained the study and you understand it, you will be asked to sign this form if you wish to participate. You will be given a copy for your records.

The purpose of this study is to determine the social/emotional levels of students with ADHD. The results of this study may help professionals be more effective in their work with teenagers identified as those with ADHD.

Your participation in this study will involve completing a behavior rating scale and a behavior checklist about _____. The first form will ask questions about social and emotional issues. It is commonly used in Jenks Public Schools for evaluations in special education. The second form is a checklist of behaviors often asked by medical doctors to help determine the diagnosis of ADHD. Both forms can be completed in 10-20 minutes.

It is important you understand that:

1. Your decision to participate in this study is voluntary. You have the right to choose not to respond to questions on the forms.

2. All of the information collected will be held as confidential and will be coded in order to keep identification of any of the participants anonymous.

3. If you have any questions about the study, I can be reached at 299-4411. In addition, you may contact Ms. Gay Clarkson, IRB Executive Secretary at Oklahoma State University (405) 744-5700. She will be happy to answer any questions or concerns you might have. Her address is 305 Whitehurst Hall, Oklahoma State University, Stillwater, Oklahoma 74078-0075.

Please indicate below if you would like the results of the study. I will be happy to send them to you.

I give my consent to participate in research conducted by Nancy Barton, school psychologist at Jenks Public Schools. I am aware that I will be asked to complete a rating scale and an ADHD checklist (if appropriate for the student).

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

Signature _____

I would like a copy of the results of this project. Yes __ No_____

I have explained this form to the teacher before requesting his/her signature. A copy has been given to him/her.

Signature _____
                    Nancy Barton

VITA

Nancy Faye Barton

Candidate for the Degree of

Doctor of Philosophy

Thesis: DEPRESSION IN ADOLESCENTS WITH ATTENTION DEFICIT
          HYPERACTIVITY DISORDER: USING CONDITIONAL PROBABILITIES
          BASED ON TEACHER RATINGS FROM THE BEHAVIOR ASSESSMENT
          SYSTEM FOR CHILDREN

Major Field: Applied Behavioral Studies

Biographical:

   Personal Data: Born in Chadron, Nebraska, March 17, 1949, the daughter of
        Richard W. and Velesta M. Coleman

   Education: Graduated from Rapid City High School, Rapid City, South Dakota, May 1967;
        received Bachelor of Science degree in Special Education from the University of
        Tulsa, Tulsa, Oklahoma, May 1971; completed the requirements for the Master of
        Education degree with a major in Guidance and Counseling at Northeastern State
        University, August 1976; completed requirements for Doctor of Philosophy degree
        May, 1999.

   Professional Experience: Teacher, elementary children with mental retardation, Tulsa
        Public Schools, September, 1971 to May 1974; Teacher, elementary children in first
        grade, Jenks Public Schools, September 1974 to May 1975; Elementary counselor,
        elementary children grades 4-6, Jenks Public Schools, September 1975 to May
        1976; Secondary counselor, secondary children grades 9-12, Jenks Public Schools,
        September 1976 to May 1988; School psychometrist, elementary and middle school
        children, Jenks Public Schools, September 1994 to May 1995; School psychologist,
        secondary level, Jenks Public Schools, September 1995 to present.

   Professional Memberships: Jenks Classroom Teacher Association, Oklahoma Education
        Association, National Education Association, Oklahoma School Psychological
        Association, National Association of School Psychologists