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Concurrent Validity of the Clinical Assessment of Depression with the Beck Depression Inventory-Second Edition

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CONCURRENT VALIDITY OF THE CLINICAL ASSESSMENT OF DEPRESSION WITH THE BECK DEPRESSION INVENTORY-SECOND EDITION

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Depression is a disorder that can affect every aspect of one's life, ranging from physical health issues to interpersonal relationship difficulties. Therefore, it is imperative that the depressive symptoms of college students be identified, evaluated, and treated. Self-report measures are a common technique to identify depressive symptomatology in individuals and assist in diagnosis and treatment. Existing measures are often used as a criterion by which to validate the psychometric properties and effectiveness of newly designed, self-report measures. The purpose of this investigation was to explore the concurrent validity of a newly published self-report measure of depression, the Clinical Assessment of Depression (CAD; Bracken & Howell, 2004) with an existing measure, the Beck Depression Inventory-Second Edition (BDI-II; Beck, Steer, & Brown, 1996). The sample used for this investigation consisted of 125 college students (38 males and 87 females) ranging in age from 18 to 52 years. Internal consistencies for the sample were computed for the BDI-II and the CAD and were found to be in the acceptable range with computed coefficient alphas from $r = .87$ to .97. Significant, moderate to strong positive correlations were found between the CAD total score and the CAD subscales with the BDI-II total score and ranged from .55 to .97. This study also investigated gender differences on both measures. Independent *t*-tests were computed and found no significant difference between male and female mean scores on either the CAD or the

BDI-II. Classification consistency between the CAD diagnosis of depression and the BDI-II diagnosis of depression using the BDI-II as the criterion was 82%. The measures have high consistency when identifying individuals as falling within a clinically significant diagnostic category of depression. Overall, results indicate that the CAD is a valid measure of depressive symptomatology in college students.

Introduction

Depression is frequently referred to as the "common cold" of psychological disorders as it is a common complaint that brings individuals in for psychological treatment. Kessler et al. (2003) compiled prevalence rates from several large epidemiological studies estimating the prevalence rate for major depressive disorder. They found the prevalence rate to be approximately 16% across the lifespan and 6.5% in the last 10 months. Kessler et al. (2003) further substantiated that women are twice as likely to have mood disorders as men. Since depression is a common, frequently noted psychological disorder, it is important to assess the nature and severity of depression in order to appropriately treat the disorder.

Assessment of psychological disorders, such as depression, typically involves the use of interviews and standardized instruments (Camara, Nathan, & Puente, 2000). When new standardized measures are developed, it is important to determine their effectiveness relative to existing measures. The Clinical Assessment of Depression (CAD; Bracken & Howell, 2004) is a newly published measure that purports to assess depression across the lifespan. Of interest to this study will be the CAD's ability to assess and identify college aged individuals' symptoms of depression relative to an existing measure in the field.

The following literature review will provide a rationale and purpose for investigating the validity of the CAD. First, an overview of depression in college students will be provided, along with a discussion of gender differences in depression.

The diagnostic criteria for unipolor mood disorders will be provided as a basis for understanding the assessment of depression. Last, a discussion of the CAD and rationale for selection of the criterion measure, the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), will provide a basis for the research questions for this study.

Review of Literature

Depression in College Students

There are approximately 19 million American adults affected annually by depression, and college students are not exempt from the disorder. Nearly 10 percent of college students arrive on campus with a history and/or diagnosis of depression. Further, 13 percent of female college students have a history of this disorder (National Mental Health Association [NMHA], 2004; UMICH Health System, 2003). Typically the onset of depression occurs between the ages of 15 and 19 years, and depression is frequently comorbid with other disorders (UMICH Health System, 2003). Blazer, Kessler, McGonagle, and Swartz (1994) found that the age groups of 15-to 24-year-olds and 35-to 44-year-olds were more likely than older individuals to have comorbid depression with such psychiatric conditions as phobia, manic episode, nonaffective psychosis, generalized anxiety disorder, panic disorder, or substance abuse or dependence.

College students experience similar symptoms as other adults who have depression, but more specifically they experience pleasure and mood problems, tend to withdraw from friends and activities that were once considered enjoyable, and have difficulty performing academically. In addition, they experience problems concentrating, feelings of being overwhelmed, and changes in appetite and sleep patterns. Because of the physical distance between college students and their parents, as well as parents' possible reluctance to disturb their child's newfound independence by asking about

her or his well-being, it is often a student's friend, roommate, or residence hall advisor who is the first to become aware of these behavior changes (UMICH Health System, 2003).

Undiagnosed and untreated depression can have an adverse impact on college students, such as hindering one's ability to work, socialize, achieve academically, and enjoy life in general. It can also lead to suicide. In 1998, suicide was the third leading cause of death for those ages 15 to 24 and the second leading cause of death for college students (NMHA, 2004). Therefore, the non-identification of depression can lead to serious, and sometimes life-threatening, consequences.

Gender and Depression

When examining the prevalence rates of depression by gender, females are noted to experience depressive moods nearly twice as frequently as males (American Psychiatric Association [APA], 2000; Blazer et al., 1994; Kelly, Kelly, Brown, & Kelly, 1999; Kessler, McGonagle, Nelson et al., 1994; Klerman, 1988; NIMH, 2000; Weissman et al., 1993). Ratios as high as 3:1 have been noted by some researchers (Klerman & Weissman, 1989; Wetzel, 1994). Females have a higher lifetime prevalence rate for major depression and dysthymia than males. Specifically, Weissman et al. (1993) found females to have a higher rate of major depression (8% compared to 3.5%) than males, as well as a higher rate of dysthymia (5.4% compared to 2.6%) in the United States. The Cross-National Collaborative Group (Weissman et al., 1996) assessed depression rates in 10 countries and found that rates of major depression were higher for females than males in every country, although the ratio varied from 1.6:1 in Beirut and Taiwan to 3.1:1 in West Germany. Although research from Kessler, McGonagle, Zhao et al. (1994)

supports the consensus regarding higher rates of depression in females compared to males, it indicates that males ages 20 to 30 experience a higher rate of depression than females. Although there is some variability among studies regarding the prevalence of depression in females in comparison to males, the findings that females experience depressive moods nearly twice as often as males appear to be reliable and stable.

The prevalence rate of depression not only varies between genders but it also varies across ages. Depression occurs more frequently in younger individuals, beginning in early adolescence, than older individuals (Reinherz, Frost, and Pakiz, 1991). According to Cyranowski, Frank, Young, and Shear (2000), there is a general increase in rates of depression for adolescent girls ages 11 to 13. By the age of 15, females are twice as likely to have experienced a depressive episode as males. Although the reasons for the higher rate of depression in females are unclear, some suggestions are provided to account for this variability between genders. According to the NMHI study (1997), some possible reasons for the higher prevalence rates are that females, in general, may be more willing to seek help than males and therefore have a higher number of entries in the depression database. Biological differences between females and males may also play a role. An updated NIMH (2000) report suggests that hormonal changes associated with women's menstrual cycle, pregnancy, and the postpartum period may be related to the higher rates of depression in females. Certain psychosocial factors, such as different social roles and less favorable economic opportunities, may contribute to this increased rate. Also, the interpersonal relationships of females may play a role in their increased risk of depression. For example, relationships seem to have a more profound effect on the self-concept of females than on males. Furthermore, females are more prone to

experience distress from negative events in others' lives and place their needs secondary to the needs of others (American Psychological Association [APA], 2002). According to the American Psychological Association (APA, 2002), the cognitive styles of females can contribute to their increased susceptibility to depression. For example, a ruminative cognitive style, which is associated with severe and longer episodes of depression and more commonly seen in females than males, is the repetitive focus on the symptoms, causes, and consequences of distress. Breslau, Schultz, and Peterson (1995) suggest that the increased rate of anxiety found in females earlier in life in comparison to males may also play a role in the higher risk of female depression.

While females are twice as likely to experience depression in comparison to males, other findings suggest that females report more depressive symptoms and greater severity of depressive symptoms than males (e.g., Baron & Campbell; 1993, Casper, Belanoff, & Offer, 1996; Kelly et al., 1999). Kelly et al. (1999) performed a study with college-age participants and found a significant main effect for gender, $F(3,138) = 2.69$, $p < .05$, with females scoring higher than males. In a study comparing female and male mean scores on the Reynolds Adolescent Depression Scale (RADS) and the Beck Depression Inventory (BDI), Baron and Campbell (1993) found that females have higher mean scores on discriminating items. A study performed by Casper et al. (1996) also found that females reported higher levels of depression than males across race. According to Bailey, Wolfe, and Wolfe (1996), Caucasian females report significantly higher levels of depression than either African-American or Caucasian males. These findings support the view that females, in general, report more depressive symptoms than

males. These gender differences in severity of rating may be due to previously mentioned factors such as hormones, psychosocial issues, and coping styles.

Diagnostic Criteria

For a young adult to be diagnosed with depression, specific criteria of the Diagnostic and Statistical Manual of Mental Disorders-4th Edition Text Revision (DSM-IV-TR; APA, 2000) must be met. There are three types of unipolar depressive disorders described in the DSM-IV-TR: (a) Major Depressive Disorder, (b) Dysthymic Disorder, and (c) Depressive Disorder Not Otherwise Specified.

Major Depressive Disorder, a severe form of unipolar depressive disorder, is characterized by one or more major depressive episodes. These episodes last for at least two weeks and consist of depressed mood and loss of interest in daily activities. To be diagnosed with Major Depressive Disorder under the DSM-IV-TR criteria, one must also have at least five or more of the following symptoms: "change in weight and/or appetite, sleep, and psychomotor activity; decreased energy; feelings of worthlessness or guilt; inability to concentrate or make decisions; or frequent thoughts of death and suicide ideation" (APA, 2000, p. 356).

The second form of unipolar depressive disorder, Dysthymic Disorder, is considered to have similar yet less severe symptoms than those of Major Depressive Disorder. Individuals with this disorder are chronically depressed most days for at least two years. Reported as feeling "down in the dumps," individuals diagnosed with this disorder must meet at least three of the following symptoms during these depressed mood states, according to DSM-IV-TR criteria: "poor appetite and/or overeating; insomnia and/or hypersomnia; low energy and/or fatigue; low self-esteem; poor concentration

and/or difficulty making decisions; or feelings of hopelessness" (APA, 2000, p. 374). Although Dysthymic Disorder is typically considered less severe than Major Depressive Disorder, a longitudinal study performed by Klein and Schwartz (2000) reported that patients with Dysthymia had more severe mood symptoms, were more likely to make suicide attempts, were more likely to be hospitalized, and had more functional impairments than those patients with Major Depressive Disorder.

The third form of unipolar depression, Depressive Disorder Not Otherwise Specified, is typically used when a disorder with depressive characteristics does not meet the DSM-IV-TR criteria for major depression or dysthymia. An example of Depressive Disorder Not Otherwise Specified is minor depression in which the depressive episodes last at least two weeks but less than five symptoms are present from the criterion list for major depression (APA, 2000).

Depression is diagnosed from observations or self-reports of at least 5 of the 9 behavioral indicators included in the diagnostic categories. Behavioral indicators of depression cover a wide range of cognitive, affective, and physical symptoms. Because of the variability and severity of depression, it is important that instruments used to measure depression adequately cover the range of symptoms evident in depression, along with being valid and reliable measures.

Self-Report Measures of Depression

A diagnosis of Major Depression, Dysthymia, and Depressive Disorder Not Otherwise Specified is given after a comprehensive assessment is performed that would determine the individual's symptoms and behavior patterns. In addition to observations and oral reports, self-report scales are frequently used in the process of a comprehensive

psychological assessment and are the focus of this investigation. Self-report measures give the individual the opportunity to report her or his internal emotions, thoughts, and feelings. The individual can provide more direct, first-hand information regarding her or his internal state which may offer more insight about her or his personal experience with depression than a third party's observations of symptoms and behaviors.

Self-report measures, which are typically norm referenced instruments, are designed in such a way that the individual responds to a series of questions concerning her or his social and/or emotional behavior, and these responses are then compared to a population sample. It has been suggested by Martin (1988) that in order for a self-report measure to be considered objective, it must have adequate test-retest reliability, standardized procedures, adequate validity, and provide normative data for comparison.

One standardized, self-report measure frequently used to assess depression is the Beck Depression Inventory which is currently in its second edition. It was originally published in 1961 (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and underwent amendments in 1979 and was most recently revised as the BDI-II (Beck, Steer, & Brown, 1996). This self-report measure of depression is one of the 50 most frequently used psychological tests used by clinical and neuropsychologists, according to a national study by Camara, Nathan, and Puente (2000).

The BDI-II is a 21-item, self-report measure that assesses the severity of depression in individuals aged 13 years and older. The current version was modified to assess symptoms which correspond with those of the American Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition* (DSM-IV; 1994) criteria for diagnosing depressive disorders. The BDI-II omitted four previous

items (Weight Loss, Body Image Change, Somatic Preoccupation, and Work Difficulty) and replaced them with four new items (Agitation, Worthlessness, Concentration Difficulty, and Loss of Energy). This change was made to address symptoms typical of severe depression or depression which may require hospitalization. Additional modifications made to the BDI-II were the adjustment of two items to allow for fluctuations in appetite and sleep, as well as the rewording of statements used in rating other symptoms (Beck, Steer, & Brown, 1996).

The BDI-II is one of the most widely used measures among practitioners (Camara et al., 2000). It takes approximately 5 to 10 minutes to complete and can be administered individually or orally to participants with reading and/or concentration difficulties. Participants are asked to select one of 4 statements for each of a group of 21 test items that best describes how she or he has been feeling for the past two weeks, including the day of the assessment. Items are rated on a 4-point scale, ranging from 0 to 3, and then each rating is summed to derive a total score. The maximum total score of the BDI-II is 63. Total scores of 0 to 13 indicate "Minimal" depressive symptomatology, 14 to 19 represent "Mild" depressive symptomatology, "Moderate" depressive symptomatology is represented by scores of 20 to 28, and total scores of 29 to 63 represent "Severe" depressive symptomatology (Beck, Steer, & Brown, 1996). The manual recommends a cutoff score of 17 for research purposes, which will be used in the present study. Although the BDI-II assists in identifying the presence and degree of depressive symptoms, the authors warn that it should not be used as a single, clinical diagnosis instrument due to a variety of disorders, such as panic disorder and schizophrenia, that may accompany depression (Beck, Steer, & Brown, 1996).

According to Arbisi (2001), the BDI-II possesses several strengths. It is an easily administered instrument with straightforward interpreted guidelines. The test manual is well-written, offering the reader an abundance of information regarding norms, factor structure, and nonparametric item-option characteristic curves for each item. The BDI-II is built on a strong empirical foundation of almost 40 years of research to support the effectiveness of earlier versions.

Statistics for the BDI-II indicate that it is a reliable and valid measure to assess depressive symptoms (Beck, Steer & Brown, 1996; Osman, Kopper, Barrios, Gutierrez, & Bagge, 2004; Storch, Roberti, & Roth, 1997). As mentioned, Martin (1988) suggests specific criteria are necessary for a measure to be considered an objective tool. The BDI-II has an established test-retest reliability of .93 (Arbisi, 2001; Beck, Steer, & Brown, 1996; Farmer, 2001). It has a specific, standardized procedure in which items are given to individuals in a consistent manner, and normative data is used for comparison of an individual's score to scores of a larger group. Furthermore, the validity of the BDI-II has been well established (Beck, Steer, & Brown, 1996; Osman, 2004; Storch et al., 1997). Convergent and discriminant validity of the BDI-II has been established by comparing it to existing psychological measures, such as the Beck Hopelessness Scale (BHS) and the Revised Hamilton Psychiatric Rating Scale for Depression (HRSD-R). The BDI-II was found to correlate positively with both the BHS (.68) and the HRSD-R (.71). In general, reviewers agree that the BDI-II is a psychometrically sound measure that has been improved with its most recent version (Arbisi, 2001; Farmer, 2001).

Although the BDI-II is considered the 10th most frequently used test by clinical psychologists who conduct assessment services (Camara et al., 2000) and is used as the

criterion measure for this investigation, it does have some weaknesses. As with any self-report measure, it is possible for an individual to exaggerate her or his presentation. The BDI-II does not have a validity scale to gauge for the possible distortion of results (Arbisi, 2001). Furthermore, normative samples of the clinical population (suburban and urban sections of the Northeastern United States) and non-referred population (Canada) were not stratified to be representative of the U.S. population (Arbisi, 2001; Farmer, 2001). The authors of the BDI-II also failed to examine the test items for gender bias (Farmer, 2001). Despite these obvious disadvantages, reviewers generally agree that the BDI-II is a psychometrically adequate measure that has been improved with its most recent revision (Arbisi, 2001; Farmer, 2001).

The Clinical Assessment of Depression (CAD), developed by Bracken and Howell (2004), is an instrument designed to measure depression in individuals between the ages of 8 and 79 years using a single form. The CAD is a 50-item scale with a four-option response (Strongly Disagree, Disagree, Strongly Agree, and Agree). The CAD assesses depressive symptoms on four subscales: Depressed Mood, Anxiety/Worry, Diminished Interest, and Cognitive and Physical Fatigue. Specifically, the developers focused on obtaining a nationally representative standardization sample and developing an instrument that would provide validity scales, as well as symptom-based scales that were psychometrically sound. In addition, the developers of the CAD wanted to provide a measure that could be used to assess depression across the lifespan.

The normative population of the CAD was stratified by age, gender, and race/ethnicity according to the 2001 census data (Bracken & Howell, 2004). Sampling was stratified geographically, although it oversampled the Midwest and undersampled the

Northeast. Total score coefficient alpha reliabilities for the standardization sample range from .96 to .97 across the age ranges. For the four scales, coefficient alpha reliabilities range from .78 to .96 which generally exceed the .90 criterion proposed by Bracken (1987) for scales used for diagnostic decision-making. The standard error of measurement for the *T* scores ranges from 2 to 5. Reliability coefficients for gender and ethnicity are reported to be strong from .82 and above. Test-retest intervals of 7 to 36 days and 1 to 51 days for child and adult samples respectively yielded a CAD Total Test stability coefficients of .85 and .86, respectively. Confirmatory factor analyses of the sample for three age groupings of CAD normative sample yielded a four-factor model consistent with the test structure. Thus, the CAD appears to be an improvement over existing measures of depression, psychometrically as well as conceptually and pragmatically. Information from the test manual suggests that it is more statistically sound than previous measures, theoretically more well-defined with the use of its four subscales, and it is a brief tool that can be used for all ages.

Independent research has generally supported the findings of the authors of the CAD. Bowers (2004) examined the relationship between the BDI-II and the CAD among 122 adolescents (22 clinical, 98 nonreferred) and found a significant positive correlation coefficient of .77 between the total scores of the BDI-II and the CAD. Tinsley (2004) found a significant positive correlation between the CAD and the Reynolds Adolescent Depression Scale (RADS, r = .88). Classification consistency between the CAD and the BDI-II was 82% and between the CAD and the RADS was 83% for the total sample. Coefficient alpha for the CAD for Bowers and Tinsley's sample was strong, r = .98, with

item corrected correlations ranging from .81 to .88 for the subscales (Jones, Tinsley & Bowers, 2005).

In summary, both the CAD and the BDI-II are adequate measures of depression; however, the CAD appears to have a more superior and stratified sampling population and demonstrates a sound factor structure for each scale. Although the BDI-II does have weaknesses, it is the most frequently used measure to assess depressive symptoms and, therefore, is a reasonable measure to use for comparison.

Purpose of Present Investigation

Depression is a high incidence, psychological disorder that can cause an increased risk for health and interpersonal problems. Although this disorder is found in both males and females, research supports that females experience depressive moods twice as often as males (APA, 2000; Blazer et al., 1994; Kelly et al., 1999; Kessler, McGonagle, Nelson et al., 1994; Klerman, 1988; NIMH, 2000; Weissman et al., 1993). Further, studies have shown that not only do females report more depressive symptoms than males but they have a greater severity of depressive symptoms, as well (e.g., Baron & Campbell, 1993; Casper, Belanoff, & Offer, 1996; Kelly et al., 1999). Self-report measures are essential tools used to assess depression and aid in the diagnosis and treatment of this often crippling disorder. One way to judge a new measure is to compare it to an existing measure which can validate its usefulness and psychometric properties. The *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999) recommend that this comparison occur prior to the new measure's use in the field. As previously discussed, the BDI-II is a psychometrically adequate and frequently used measure to

assess depression. Therefore, it is reasonable to use the BDI-II as the criterion measure to evaluate a new, similar measure-CAD.

This investigation explored the convergent validity of a newly published self-report measure of depression , the Clinical Assessment of Depression (CAD),with an existing measure, the Beck Depression Inventory-Second Edition (BDI-II). Along with concurrent validity, gender differences in scores obtained and classification efficacy of the CAD were explored. Specific hypotheses for this investigation were as follows:

1. A significant positive relationship will be found between the ratings obtained on the CAD and the BDI-II for a college population for the total scores on each measure and each subscale of the CAD with the total score of the BDI-II.

2. Higher mean scores will be obtained by females than males on both measures. High classification efficacy is defined as classification agreement between the BDI-II and the CAD equal to or greater than 80 percent.

3. Classification efficacy will be high using the BDI-II as the criterion measure.

Method

Participants

The sample consisted of 125 college students (38 males and 87 females) ages 18 to 52 from a south central Kentucky university enrolled in undergraduate psychology courses in which instructors offered alternative methods for obtaining extra credit. The mean age of this sample was 22, and it consisted of 110 Caucasians, 8 African Americans, 1 Asian, and 6 Other. The sample also consisted of individuals with a previous diagnosis of depression (13), comorbid depression (12), or no previous diagnosis (105). Independent samples t tests were used to determine if the number of individuals with a prior diagnosis was influencing or biasing the sample. No significant difference was found on either of the measures between those with a diagnosis and those without a diagnosis of depression (BDI-II $t(125) = 2.153$, $p = .06$; CAD $t\ (125) = 1.943$, $p = .06$). Therefore, the participants of this study were viewed as one sample, rather than placing them into diagnosed and non-diagnosed groups. Data on the BDI-II from five female participants were incomplete and had to be excluded from the analyses of this study.

Instruments

Demographic Form. A demographic form was used to track gender, race, age, and history of depression for the sample (see Appendix A). The form also requested contact information for each participant. The latter information was obtained in case responses indicated a possibility of harm to self.

Beck Depression Inventory-Second Edition (BDI-II). The BDI-II is a 21-item, self-report inventory that measures symptoms of depression. The current edition is considered to be more psychomentrically improved over the previous editions (Arbisi, 2001; Farmer, 2001). The reliability of the BDI-II has been shown to be adequate with both clinical and nonclinical populations. Internal consistencies for clinical and nonclinical populations fall within the .89 and above range (Beck, Steer, Ball et al., 1996; Beck, Steer, Brown et al., 1996; Jones, Tinsley & Bowers, 2005, Steer & Clark, 1997). Beck, Steer, and Brown (1996) found a test-retest reliability coefficient of .91 over a one-week period.

Convergent and discriminant validity of the BDI-II was established by comparing it to existing psychological measures and examining the factor structure of the scale. Convergent validity with strong correlations was reported between the BDI-II with the Revised Hamilton Psychiatric Rating Scale for Depression (r = .71) and the Beck Depression Inventory (r = .93). Moderate correlations are noted with scales measuring the related constructs of anxiety (Hamilton Rating Scale for Anxiety – Revised r = .47) and hopelessness (Beck Hopelessness Scale r = .37; Beck, Steer, & Brown 1996). Farmer (2001) reports that factor analysis has not yielded consistent findings with respect to the factor structure for various populations (Beck, Steer & Garbin, 1988) and that the measure is intended to assess one construct and should only be interpreted to assess one construct.

Although the BDI-II is one of the most frequently used measures of depression (Camara et al., 2000) and generally evidences sound psychometric properties, it does evidence some weaknesses. Arbisi (2001) pointed out that the lack of a validity scale to assess for distortions of responses and the lack of a stratified normative population were

weaknesses of the BDI-II. Farmer (2001) indicated that the lack of analysis of the items for gender bias is a significant problem. Despite these weaknesses, reviewers generally agree that the BDI-II is a psychometrically adequate measure that has been improved with its most recent revision (Arbisi, 2001; Farmer, 2001).

Clinical Assessment of Depression (CAD). The CAD (Bracken & Howell, 2004), is a 50-item scale that takes approximately 10 minutes for completion. The age range for this measure is 8 to 79 years. The CAD assesses depressive symptoms correlating with DSM-IV criteria on four subscales: Depressed Mood, Anxiety/Worry, Diminished Interest, and Cognitive and Physical Fatigue. The wording and content of items on all four subscales are considered appropriate for use across the age span. The CAD was designed as a comprehensive instrument that could be used across clinical, educational, and research settings.

Due to the CAD's recent publication, it does not have the history and vast amount of supportive research as the BDI-II; however, numerous subsample pilot studies and two independent research investigations have provided some evidence of its psychometric soundness. According to the Clinical Assessment of Depression Manual (Bracken & Howell, 2004), its sound psychometric properties are substantiated by the use of a large, diverse, national normative sample. Four normative age levels were used in the development of this instrument (i.e., ages 8 to 11 years, 12 to 17 years, 18 to 25 years, 26 to 79 years) to determine its psychometric properties. The Total Scale score of the CAD has coefficient alpha reliabilities that range from .96 to .97 and vary little by age, race, and gender. The coefficient alphas for the subscales, which vary somewhat due to sample size, are as follows: Depressed Mood, which evidences the highest reliability

among the subscales, ranged from .95 to .96; Anxiety/Worry ranged from .83 to .86; Diminished Interest ranged from .79 to .86; and Cognitive and Physical Fatigue ranged from .82 to .87. In addition, the author reported that confirmatory factor analysis strongly support the four subscale structure. Also, the test-retest reliability for the CAD's Total Scale score ranged from .81 to .87 with a correlation between the CAD Total Scale score and the BDI-II (.71) establishing concurrent validity.

Independent research was also performed to assist in the support of the CAD as a sound measure. A study performed by Bowers (2004) examined the relationship between the BDI-II and the CAD among clinical (n=23) and nonclinical (n=99) adolescents, which indicated a correlation between the two measures of .77. Tinsley (2004), using the same sample as Bowers (2004), analyzed the relationship between the CAD and the Reynolds Adolescent Depression Scale (RADS). The correlation between the Total Scale scores of the CAD and RADS (r = .88) was slightly higher than that of the CAD and BDI-II, as well as the correlations found in both the combined clinical (r = .64) and nonclinical (r = .82) adolescent groups used in a validity study with the normative sample using the CAD and the RADS (Bracken & Howell, 2004). Tinsley's (2004) findings were also consistent with Bower's (2004) results, reporting a classification consistency of 83% for the total sample of both the CAD and the RADS. Jones, Tinsley, and Bowers (2005) reported coefficient alpha of .98 for the CAD and item corrected correlations ranging from .81 to .88 for Bowers (2004) and Tinsley's (2004) sample.

Based on data presented by the aforementioned studies, the CAD appears to be an improvement over existing measures of depression. It has a representative normative population and evidence of good reliability across gender, age, and race among both

clinical and nonclinical groups. Construct validity is evidenced through confirmatory factor analysis by its strong intercorrelations between each subscale and total scale scores, as well as high correlations with existing measures (BDI-II and RADS).

Procedure

Participants were recruited from psychology courses at a south central Kentucky University through the Student Study Board in which instructors offered alternative methods for obtaining extra credit. The Student Study Board is an electronic system which students can access and sign up for research study participation through a website. Walk-in participants were also accepted for this study. Once the sign-up process was completed, participants received information regarding specific time and location for the study. At her or his designated time, each participant individually received and was asked to complete a consent form (see Appendix B). Because data collection for the present study overlapped with another investigation, the Beck Anxiety Inventory (BAI) and the Brief Symptom Index (BSI), along with the BDI-II and the CAD, were included in the packet. After consent was obtained, each participant received a packet of forms (demographic form [Appendix A], CAD, BDI-II, BAI, and BSI) in counter-balanced order to control for order effects. Upon completion of the four scales and the demographic form, the participants were asked to return them to the investigator. After the packet was returned to the investigator, each participant received a debriefing statement (see Appendix C).

In order to maintain confidentiality, names were kept separate and did not appear on the forms. A coding system was used for the forms to facilitate participant

identification in the event any responses indicated a clinically significant level of symptomatology. Seven participants were identified as having a clinically significant response and were asked to meet with the primary investigator in private to discuss her or his scores. The primary investigator provided information about depression and a list of community resources for further assistance. All procedures for this study were approved by Western Kentucky University's Human Subjects Review Board (see Appendix D).

Results

This study had three purposes: (a) to examine the relationship between the CAD and the BDI-II, (b) to determine whether gender differences, specifically females having higher mean scores, exist on both measures, and (c) to explore the classification consistency using the BDI-II as the criterion measure. Additional analyses were conducted to determine the reliability of each measure for this sample and to determine the strength of the correlation of each CAD scale with the CAD Total score when the scale items are partialed out.

Table 1 provides the mean score (*M*), the standard deviation (*SD*), and the standard error of measurement (*SEM*) for the raw scores on each measure for the total sample and for each gender. To examine the relationship between the BDI-II and CAD, Pearson product-moment correlation coefficients were computed for the total raw scores for each scale and the subscales of the CAD (i.e., Depressed Mood, Anxiety/Worry, Diminished Interest, and Cognitive and Physical Fatigue) with the BDI-II total raw score. Using the Bonferoni approach to control for Type I error across the 15 correlations, a p value of less than .003 was established for significance. The results of the correlational analyses are presented in Table 2. All of the 15 correlations were found to be positive and statistically significant which supports the first hypothesis.

Additional analyses indicate that the CAD has item-total correlations within the acceptable range with computed coefficient alphas from $r = .87$ to .97. Coefficient alpha

Table 1

Descriptive Statistics for the Raw Scores on the CAD[a] and the BDI-II[b]

	CAD				BDI-II			
Sample	N	M	SD	SEM	N	M	SD	SEM
Male	38	93.79	25.55	4.15	38	11.32	8.72	1.42
Female	87	86.11	21.80	2.34	87	8.26	6.56	.70
Total	125	88.45	23.17	3.45	125	9.19	7.38	.66

[a]Clinical Assessment of Depression. [b]Beck Depression Inventory-Second Edition.

Table 2

Correlations of CAD[a] Total Score and Scales with BDI-II[b] Total Score, Coefficient Alphas and Corrected item Total Correlations for the CAD[a].

Subscale	1	2	3	4	5	6
1. CAD Total Score	.97[c]	.95*(.84)	.89*(.82)	.82*(.79)	.90*(.84)	.68*
2. CAD, Depressed Mood	-	.96[c]	76*	.78*	.78*	.63*
3. CAD, Anxiety/Worry	-		.88[c]	68*	.82*	.62*
4. CAD, Diminished Interest	-			.90[c]	.69*	.55*
5. CAD, Cognitive and Physical Fatigue	-	-			.87[c]	.63*
6. BDI-II Total Score	-	-	-	-	-	.89[c]

Note. Values enclosed in parenthesis represent corrected item total correlations for the CAD scale.

[a]Clinical Assessment of Depression. [b]Beck Depression Inventory-Second Edition.

[c]Values represent coefficient alpha.

*p<.003

for the BDI-II total score was acceptable but lower (r = .89). Corrected item total correlation coefficients for each CAD scale were computed correlating each scale with the other three CAD scales. All corrected item total correlations were strong ranging from r = .79 to r = .84.

To determine whether gender differences were present, independent samples *t*-tests were computed to compare mean scores of females to males for each measure. Levene's Test for Equality of Variances was computed due to the unequal number of participants in each group and found to be significant (p=.03) for the BDI-II. Therefore, the *t*-test where variances are not assumed to be equal was used. The test for the BDI-II was not significant, $t(56) = 1.932$, p = .06. The CAD results were also found to be nonsignificant, $t(123) = 1.717$, p = .089. The results indicate no significant gender difference on either measure. Thus, hypothesis two was not supported.

To investigate classification efficacy of the CAD, the BDI-II was used as the criterion measure. According to Bracken and Howell (2004), a T-score of 60 should be used as the cut-off score to determine depressive symptomatology in the clinically significant range. A raw score of 17 was used to indicate a clinically significant score on the BDI-II as recommended in the manual (Beck, Steer, & Brown, 1996). A 2 x 2 contingency table was computed (Table 3) to compare depressed and non-depressed classifications for the sample on each measure. The examination of the classifications of both measures resulted in a $X^2 = 22.97$, (p < .000) and a classification agreement of 81%. The CAD identified 13% of the cases as false positives, classifying individuals to be depressed when they are not classified as depressed on the BDI-II, and 6% of the cases as

Table 3

Total Sample Classification Table Between BDI-II[a] and CAD[b] Diagnosis of Depression

	CAD Classification		
BDI-II Classification	Non-depressed	Depressed	Total
Non-depressed	70% (n=87)	13% (n=16)	83% (n=103)
Depressed	6% (n=8)	11% (n=14)	17% (n=22)
Total	76% (n=95)	24% (n=30)	100% (n=125)

$X^2 = 22.97$, $p < .001$

[a]Clinical Assessment of Depression; depression classification based on T-score ≥ 60.

[b]Beck Depression Inventory-Second Edition; depression classification based on raw score ≥ 17.

false negatives, finding individuals not depressed when they are experiencing depressive symptoms, according to the BDI-II.

Discussion

The present researcher expected to find a significant positive correlation between the CAD Total score and its subscales with the BDI-II. Total scores for each measure were expected to yield moderate to high correlations between the two measures. In addition, gender differences were to be examined for the CAD and the BDI-II. Specifically, females were expected to have higher mean scores than males on both measures. Further, classification efficacy was to be examined using the BDI-II as the criterion measure.

To address the first purpose of determining the relationship between the CAD and the BDI-II, Pearson product moment correlations were computed for the CAD total scale score, CAD Depressed Mood scale, CAD Anxiety/Worry scale, CAD Diminished Interest scale, CAD Cognitive and Physical Fatigue scale, and BDI-II total score. The correlations between the BDI-II total score and the CAD total score and its four subscales were found to be positive and significant ranging from .55 to .68, which were similar to the findings of Bowers (r = .64 to .77; 2004) and Bracken and Howell (r =.42 to .73; 2004). According to Cohen's (1988) effect sizes to determine the strength of correlations, all correlations were considered moderate, accounting for 30% to 46% of the variance between the two measures. The weakest correlation (.55) was found between the BDI-II total score and the CAD Diminished Interest scale score which was slightly less than Bowers (2004) weakest correlation (.64) between the BDI-II total score and the

CAD Diminished Interest scale score. Bracken and Howell (2004) reported a slightly weaker correlation (.42) between the BDI-II total score and the CAD Anxiety/Worry scale score. The current examination found the strongest correlation (.68) between the BDI-II and the CAD total scores to be slightly lower than Bowers' (2004) and Bracken and Howell's (2004) findings (.77 and .70, respectively).

The correlations between the CAD total score and its subscales were also found to be positive and significant, ranging from .68 to .95. The weakest correlation (.68) was found between the CAD Anxiety/Worry and Diminished Interest scale scores, while the CAD total score and the CAD Depressed Mood scale score was found to be the strongest correlation (.95). These findings are quite similar to those of Bracken and Howell (2004) with CAD total score and subscale score correlations ranging from .68 to .95, as well. Bowers (2004) produced slightly higher correlations ranging from .76 to .97. The correlations of the current study were considered moderate to strong, accounting for approximately 40% to 90% of the variance between the CAD total score and its subscale scores. Further analyses computed corrected item total correlations between each CAD scale and the other 3 CAD scales (Depressed Mood, Anxiety/Worry, Diminished Interest, and Cognitive and Physical Fatigue) and found strong correlations, as well, ranging from .79 to .84 indicating that each scale contributes similar, yet different information to the total score. These findings are consistent with those of Jones, Tinsley, and Bowers (2005) which reported corrected item total correlations between each CAD scale ranging from .81 to .88. In general, these results are consistent with previous findings and support the hypothesis that the CAD demonstrates strong concurrent validity with the BDI-II.

The reliability of the CAD and its subscales were found to be quite strong with coefficient alphas ranging from .87 to .96. These results are consistent with Bowers' (2004) findings of coefficient alphas ranging from .77 to .97 and Bracken and Howell's findings (r = .76 to .90; 2004). The Depressed Mood subscale had the strongest reliability (.96) with the overall total score, and the Cognitive and Physical Fatigue subscale had the weakest reliability (.87) with the CAD total score. The strong reliability between the CAD total score and its subscales indicate that each individual subscale loads heavily on the overall total score which provides support that the CAD is a sound measure that consistently measures associated constructs. The BDI-II, however, did not fair as well regarding reliability. Inter-item analyses were conducted to see how well each item loaded on the BDI-II total score and resulted in a coefficient alpha of .89.

Experts in the field recommend using measures with reliabilities above .90 for diagnostic purposes (Bracken, 1987). The reliability of .89 for the BDI-II does not meet this recommendation; however, the CAD meets this criterion for the Total, Depressed Mood, and Diminished Interest scales. This higher reliability suggests that the CAD best meets Bracken's (1987) criterion of .90 internal consistency for a measure used for diagnostic purposes.

The second purpose of this study was to investigate whether gender differences exist on both measures, specifically females obtaining a higher mean score than males. Independent samples *t*-tests were used to compute any mean gender differences of the CAD and BDI-II. The *t*-test computed for the BDI-II and the CAD found no gender differences in mean scores. Although results of this study do not support past research in which females report more severe ratings of depressive symptoms than males, this

finding is consistent with normative data for the CAD which found no gender differences (Bracken & Howell, 2004).

The final purpose of this study was to analyze the classification efficacy of the CAD using the BDI-II as the criterion measure. Using a 2 x 2 contingency table, the classification consistency for the total sample was found to be 81%. Although the hit rate for the total sample was found to be high, 13% were identified as false positives and 6% as false negatives. These findings were consistent with those of Bowers (2004) with a total sample classification consistency of 82% between the CAD and the BDI-II (10% identified as false positives and 8% identified as false negatives), as well as Tinsley's (2004) report of classification consistency of 83% for the total sample of both the CAD and the RADS. A false positive, which is a more conservative classification, occurred when the BDI-II identified an individual as not depressed and the CAD identified that individual as depressed. A false negative, which is a more liberal classification, occurred when the BDI-II identified an individual as depressed and the CAD identified that individual as not depressed. Although a false positive is still considered an error, it is more preventative when diagnosing depression. Therefore the greater percentage of false positive makes the CAD a more conservative measure than the BDI-II.

Limitations

Although pertinent information can be obtained from the current study, there are limitations that may impact the interpretation of the results. For example, small sample size, specifically in the male group, may have limited the findings of this study. An external threat that may have affected data collection is the sole geographic region in which data were collected for this study. The participants were recruited from a south

central Kentucky university. Although the sample's ethnicity was representative of the region (7% minority), it is not representative of the United States' population as a whole and, therefore, may not be generalizable to other geographic regions.

Implications

Practical Implications. The findings of this study have strong implications for practitioners engaged in psychological assessment. Due to the high incidence rate of depression, it is essential to have sound psychometric measures to assess this disorder, which are limited in the field of psychology. The current study assists in providing data that supports the validity of the CAD and provides support for the use of an additional assessment resource which can be used to aid in the diagnosis and treatment of depression. This study specifically provides information independent from the test publisher regarding the validity of the CAD with college students. Because depression, which has been reported to be on the rise in recent years (NMHA, 2004), can have such an adverse impact on every aspect of one's life, it is imperative to have valid, reliable, and standardized measures by which to assess this disorder for the proper identification of depressive symptoms and effective treatment. Experts recommend that measures have a reliability of .90 for diagnostic purposes. In a study using a college-age sample performed by Beck et al. (1996), results indicated a coefficient alpha of .89. Although this is considered a high internal consistency, it does not meet Bracken's (1987) criterion for diagnostic purposes. While the BDI-II had reliability below the recommended .90 level for this sample as well, the CAD reached acceptability (alphawise) for classification decisions for the total score and two of the four subscales. Furthermore, the results of this study have significant implications for practitioners' longitudinal evaluation of

clients. The CAD is designed to facilitate the identification of individuals across the lifespan and should be considered a useful tool to monitor the progress of clients. Because of this instrument's strong theoretical basis, addressed through the four subscales, and broad age range, practitioners will be able to use information from this single measure throughout the individual's treatment without the introduction of new, possibly incompatible instruments.

Recommendations for future research. The current study investigated the convergent validity between the CAD and the BDI-II, both designed to specifically measure depressive symptoms. Future research may want to examine divergent validity among various tools that measure a wider range of clinical symptoms including, but not limited to, depression. Also, additional evidence of validity should be explored through factor analysis which would further substantiate the subscale structure of the CAD. To further explore gender differences of depression, future research containing a larger, more equal sample size across gender that is pooled from a more generalizable setting would be ideal for future research.

Also, this study focused on a college-age sample consisting of predominantly Caucasian individuals in their early twenties. Further research should be conducted across various races and ages to obtain additional information regarding depression and how well the CAD assesses depression across the lifespan of individuals from different ethnic groups.

Finally, further evidence of the CAD's validity should be explored by examining a large, clinical population in comparison to a non-referred sample. By comparing a clinical and non-referred population, information could be gathered to determine whether

the CAD depicts those who have been diagnosed with depressive disorders as also demonstrating depressive symptomatology.

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Appendix A

Demographic Form

Demographic Form

Age: _____years _____months

Gender: _____ Male
_____ Female

Race: _____ Caucasian
_____ African American
_____ Asian
_____ Other

Level of Education
_____ Freshman
_____ Sophomore
_____ Junior
_____ Senior

Have you ever been diagnosed with a psychological disorder? Circle One Yes No
If yes, please respond to the following:
Who made the diagnosis? ____ Family Doctor ____ Counselor
____ Social Worker ____ Psychologist
____ Psychiatrist

What was your diagnosis?_____

Are you currently under treatment? Check all that apply: _____ Therapy/Counseling
_____ Medication

If you are not currently in treatment when did you end treatment? Year_____

_____

Name:_____

Phone:_____

E-Mail Address_____

Appendix B

Consent Form

INFORMED CONSENT
Social and Emotional Well-Being Study

Project Title: Emotional Well-Being Study
Investigators: Elizabeth L. Jones, Ph.D., Shelley Hicks, and Carlie West
Department of Psychology, 745-4414

You are being asked to participate in a project conducted through Western Kentucky University investigating the usefulness of 4 measures of social and emotional well-being used with young adults. ***Please read the following information carefully.*** It describes the purpose of the study, the procedure to be used, risks, and benefits of your participation and what will happen to the information that is collected from you. If you agree to participate in this project, Western Kentucky University requires that you give your signed agreement to participate in this project.

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask him/her any questions you have to help you understand the project. A basic explanation of the project is written below. Please read this explanation and discuss with the researcher any questions you may have.

If you then decide to participate in the project, please sign on the last page of this form in the presence of the person who explained the project to you. You should be given a copy of this form to keep.

1. **Nature and Purpose of the Project:** The purpose of this study is to evaluate a new questionnaire designed to assess social and emotional well-being in young adults.

2. **Explanation of Procedures:** Upon your consent, you will be asked to complete a packet of 4 questionnaires concerning your thoughts, feelings, and emotions as they related to your day-to-day functioning. It will take approximately 30 minutes to complete these 4 questionnaires.

3. **Discomfort and Risks:** There are no physical risks involved in filling out the questionnaires. However, answering the items may cause you to feel some emotional discomfort, due to the nature of the questions asked.

4. **Benefits:** You may be able to receive extra credit for you psychology courses, if you instructor offers such credit (be sure to check with your instructor).

5. **Confidentiality:** All information collected will be kept strictly confidential and will be accessible only to the project staff. In addition, all names will be kept separate from the questionnaires. However, if your responses to these questionnaires indicate that you may be of harm to yourself or to other people, the researchers will immediately inform you.

6. **Refusal/Withdrawal:** Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

7. **Questions:** Can be directed to the researchers collecting data or to Dr. Elizabeth Jones. Dr. Jones can be reached in her office (260 TPH) during her office hours (see schedule on her door) or at (270)745-4414.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

_____ _____
Signature of Participant Date

_____ _____

Witness Date

THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
THE WESTERN KENTUCKY UNIVERSITY HUMAN SUBJECTS REVIEW BOARD
Dr. Phillip E. Myers, Human Protections Administrator
TELEPHONE: (270) 745-4652

Appendix C

Debriefing Statement

Debriefing

Thank you for participating in this research study. This study was designed to examine the usefulness of a new measure of depression, the Clinical Assessment of Depression. For example, does the Clinical Assessment of Depression measure depression as will as other measures in the field such as the Beck Depression Inventory and the Brief Symptom Index? If you would like a final copy of the research project, please contact Dr. Elizabeth Jones at (270)745-4414, or at the Department of Psychology, Western Kentucky University, 1 Big Red Way, Bowling Green, KY 42101. The final copies will not be available until after December 1, 2005.

Appendix D

Letter of Human Subjects Review Board Approval

WESTERN KENTUCKY UNIVERSITY
Human Subjects Review Board
Office of Sponsored Programs
106 Foundation Building
270-745-4652; Fax 270-745-4211
E-mail: Sean.Rubino@wku.edu

In future correspondence please refer to HS05-087, February 15, 2005

Dr. Elizabeth Jones
260 TPH
Department of Psychology
WKU

Dear Dr. Jones:

Your revision to your research project, "Validity of the Clinical Assessment of Depression," was reviewed by the HSRB and it has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects' welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that you need to orient participants as follows: (1) signed informed consent is required; (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data. (3) Appropriate safeguards are included to protect the rights and welfare of the subjects.

   This project is therefore approved at the Expedited Review Level until December 20, 2005.

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Sponsored Programs at the above address. Please report any changes to this approved protocol to this office. A Continuing Review protocol will be sent to you in the future to determine the status of the project.

Sincerely,

Sean Rubino, M.P.A.
Compliance Manager
Office of Sponsored Programs
Western Kentucky University

cc: HS file number Jones HS05-087
cc: Shelley Hicks
cc: Carlie West