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Differentiating Anxiety and Depression Using the Clinical Assessment of Depression

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DIFFERENTIATING ANXIETY AND DEPRESSION USING THE CLINICAL ASSESSMENT OF DEPRESSION

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Table of Contents

List of Tables

DIFFERENTIATING ANXIETY AND DEPRESSION USING THE CLINICAL ASSESSMENT OF DEPRESSION

Zane K. Dempsey December, 2010 46 Pages

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Abstract

Anxiety and depression are two disorders frequently diagnosed in adults. Given serious adverse affects such as physical health problems, interpersonal relationship difficulties, and suicide, differentiation in treatment of these often comorbid disorders is a necessity in providing appropriate care. The tripartite model of anxiety and depression (Clark & Watson, 1991) proposes that these disorders are linked by a common trait (Negative Affect) and differentiated by a trait common to depression (lack of Positive Affect) and a trait common to anxiety (Physiological Hyperarousal). The Clinical Assessment of Depression (CAD; Bracken & Howell, 2004), a recently published self-report narrow-band measure of depression, includes a measure of anxiety related symptoms in its subscale structure. This study explores the validity of the CAD with two established measures: the Beck Depression Inventory – II (Beck, Steer, & Brown, 1996) and the Beck Anxiety Inventory (Beck, & Steer, 1993). College students of 18 to 52 years of age (n = 295) enrolled in undergraduate courses in psychology at a south central Kentucky university provided the study data. These individuals were divided into nonclinical and clinical samples based on self disclosure of a clinical diagnosis to examine differences between groups. Strong positive correlations (above r = .60) between

similar CAD scales and total scores on the BAI and BDI-II supported convergent validity for the nonclinical sample. All comparisons supported convergent validity for the clinical sample except the correlation between the BDI-II Total Score and the CAD - Depressed Mood subscale (r = .56). Weak to moderate correlations (r = 0.0 to .59) between dissimilar scales supported divergent validity for all dissimilar comparisons in both samples except the correlation between the BDI-II and the CAD-Anxiety/Worry subscale in the nonclinical sample (r = .66). Hotelling-Williams t-tests were performed to compare correlations of similar and dissimilar constructs. Significant results emerged most comparisons in the nonclinical group support the use of the CAD diagnostic assessment. However, nonsignificant findings for the CAD Anxiety/Worry subscale indicate that this measure lacks the ability to aid diagnose significant levels of anxiety. Only one significant difference between correlations was found for the clinical sample with the CAD – Diminished Interest subscale evidencing significantly stronger correlations with the BDI-II than the BAI. The lack of significant differences for the other CAD scales is discussed relative to the small clinical sample size and the heterogeneity of disorders represented. Results support the use of the CAD as an adequate diagnostic tool for depression with college students. Results did not support the use of the CAD in differential diagnosis of anxiety with college students within the framework of the tripartite model. Implications of the findings are discussed to aid in practice and to suggest further research.

Introduction

Anxiety and depression are two of the most common mental health disorders that affect adults today. These disorders are often comorbid with one another. As many as 59% of patients diagnosed with an anxiety disorder will experience an episode of major depression (Lepin, Wittchen, & Essau, 1993). The tripartite model of anxiety and depression as proposed by Clark and Watson (1991) attempts to explain the relationship between these disorders. According to the tripartite model, three factors explain or comprise the constructs of anxiety and depression (Chorpita, 2002): a shared feeling of distress (Negative Affect), a factor specific to depression (Positive Affect), and a factor specific to anxiety (Physiological Hyperarousal).

The Clinical Assessment of Depression (CAD; Bracken & Howell, 2004) is a new brief measure of depression that can be used across the lifespan of a patient. The CAD's unique subscale structure and the inclusion of a measure of anxious symptoms present intriguing new possibilities in discriminating between anxiety and depression. This study will use the tripartite model as a framework to evaluate the CAD's effectiveness in differentiating anxious and depressive symptoms by comparing it to two well-established measures of depression and anxiety, the Beck Depression Inventory – Second Edition (BDI-II; Beck, Steer, & Brown, 1996) and the Beck Anxiety Inventory (BAI; Beck & Steer, 1993).

The following literature review will provide justification and rationale for examining the CAD. The first section provides a brief discussion of depression and

anxiety, their features, their diagnostic criteria, and the high level of comorbidity which exists between these two common disorders. The following section details how the tripartite model of anxiety and depression purports to explain the comorbidity of the disorders. The next section of this document introduces the CAD and demonstrates the rationale for investigating the use of this instrument in discriminating between anxious and depressive symptomatology. Last, the purpose of the present investigation along with a rationale for the use BDI-II and the BAI will then be given. Discussion of measures for this study will be followed by presentation of proposed hypotheses and the corresponding analyses.

Literature Review

Depression and anxiety are common disorders that afflict a significant portion of people. The two disorders are often found to co-occur and it is proposed that both share common risk factors and traits (Clark & Watson, 1991). The following sections are meant to introduce the reader to these common disorders and some explanation of their comorbidity through the tripartite model of depression. A new measure of depression, the Clinical Assessment of Depression (Bracken & Howell, 2004), will also be introduced and its possible role in differentiating anxiety and depression will be discussed.

Depression

Mental health professionals across different fields diagnose patients as suffering from a mood disorder according to criteria listed in the *Diagnostic and Statistical Manual of Mental Disorders* – 4th Edition, Text Revision (DSM-IV-TR; American Psychiatric Association [APA], 2000). Mood disorders are characterized by the presence of a major depressive episode. Major depressive episodes are defined in the DSM-IV-TR as, "a period of time lasting at least two weeks in which an individual experiences a depressed mood or a loss of interest or pleasure in nearly all activities" (APA, 2000, p. 349).

According to the DSM-IV-TR, to be diagnosed with major depression a patient must exhibit five or more of the following symptoms: (a) a markedly depressed overall mood, (b) markedly diminished pleasure or interest in activity, (c) significant change in weight and/or appetite without dieting, (d) changes in sleep habits, (e) psychomotor agitation or retardation, (f) fatigue and/or loss of energy, (g) general feeling of worthlessness or guilt, (h) difficulty in

concentration and/or decision making, or (i) recurrent thoughts of death and suicidal ideation (APA, 2000). Symptoms of depression are considered to be at a serious level when they are detrimental to the social, occupational, or other functioning of an individual. Adult patients generally describe feeling "depressed, sad, hopeless, discouraged, or "down in the dumps" (APA, 2000, p. 349). As described in the DSM-IV-TR, younger children and adolescents may present with moods that are described as irritable or cranky (APA, 2000). Considering that only a portion of the possible symptoms of major depression are needed for diagnosis, patients suffering from depression may differ greatly in symptom patterns. This difference in expression necessitates the existence of comprehensive measures of depression that address multiple categories of symptoms.

Depression is the most commonly diagnosed mental health disorder and significantly impacts the daily functioning of those it afflicts (APA, 2000). According to the DSM-IV-TR (APA, 2000), approximately 5% to 9% of adult women and 2% to 3% of adult men suffer from major depression at any time. Culbertson (1997) concluded that approximately two times as many women in developed countries suffer from depression than men, and that in developing countries the ratio of women with depression compared to men might be as high as 4:1. The importance of recognizing depression is highlighted by the fact that as many as 15% of individuals with severe depression successfully commit suicide (APA, 2000). Those suffering from depression often exhibit co-occurring issues with substance abuse, panic disorder, obsessive-compulsive disorder, anorexia

nervosa, bulimia nervosa, borderline personality disorder, and persistent sleep disturbance (Mineka, Watson, & Clark, 1998).

Anxiety

Anxiety is defined as mental apprehension and physical tension elicited by the anticipation of a threat. People with anxiety might experience worry about the future, hyper-vigilance, a racing heartbeat, sleep disturbance, muscle tension, sweating, and other somatic stress reactions. Both aspects of this reaction are adaptations to enable humans to cope with stress and threatening stimuli. Anxiety is maladaptive in that the apprehension occurs in the absence of a threat and can significantly impact one's daily functioning (Davison, Neale, & Kring, 2006).

According to the APA (2000) there are seven different anxiety disorders that differ mainly in the focus of the anxiety. Patients with agoraphobia become anxious in instances where discreet and easy escape from an aversive situation is not possible. Patients with specific phobias experience severe levels of anxiety in the presence of particular stimuli. Others with obsessive-compulsive disorder persistently perform certain behaviors repeatedly, or compulsions, in order to relieve anxiety brought on by recurring thoughts, or obsessions. Patients with post-traumatic stress disorder experience severe anxiety when re-experiencing traumatic events. Lastly, patients with generalized anxiety disorder are characterized as experiencing general excessive worry and anxiety.

Similarly to depression, patients are diagnosed with anxiety disorders according to criterion included in the DSM-IV-TR. For the purpose of this study, discussion will

focus on the characteristics of generalized anxiety disorder as it is the most frequently occurring of the anxiety disorders. Generalized anxiety disorder is primarily characterized by a long period (six months or longer) of "excessive anxiety and worry" (APA, 2000, p. 472). The DSM-IV states that a person should find it hard to manage feelings of anxiety or worry and symptoms should be manifest in at least three of the following areas: (a) restlessness, (b) fatigue, (c) difficulty in concentrating, (d) irritability, (e) muscle tension, or (f) disturbed quality of sleep (APA, 2000). The DSM-IV-TR mentions that the focus of anxiety or worry differentiates generalized anxiety disorder and other related anxiety disorders. As in the case of depression, symptom severity exists when there is a significant detriment to social, occupational, or other functioning.

Generalized anxiety disorder is a common disorder that can impair the functioning of individuals. During the span of a year, approximately 3% of adult individuals may experience generalized anxiety disorder. Over the course of a lifetime, that number rises to about 5%. As with major depression, generalized anxiety disorder is somewhat more common in women than in men. According to the DSM-IV-TR (APA, 2000), 55% to 60% of patients in a clinical setting are female. In further epidemiological studies cited in the DSM-IV-TR, nearly two-thirds of the sample that suffered from generalized anxiety were women.

Generalized anxiety disorder is associated with a number of physical symptoms and other disorders. Physical symptoms may include autonomic nervous system hyperarousal, somatic symptoms, sweating, trembling, and shakiness. Although present

in generalized anxiety disorder, these symptoms may present more prominently in other anxiety disorders such as panic disorder and post-traumatic stress disorder (APA, 2000). Generalized anxiety disorder is often connected with somatic issues related to high levels of stress such as headaches and irritable bowels.

Comorbidity of Mood Disorders and Anxiety

Depression and anxiety are often found to be associated with each other (Seligman & Ollendick, 1998). According to Davison and colleagues (2006), approximately 60% of people diagnosed with an anxiety disorder will have at least one major depressive episode. Diagnosticians and researchers often encounter difficulties when trying to separate the two disorders into distinct classifications (Nitschke, Heller, Imig, McDonald, & Miller, 2001). The close relationship between these disorders was noted as early as Hippocrates (Hranov, 2007). Some propose that our classifications of these disorders and subtypes are simply due to superficial similarities in diagnostic criteria such as the presence of worry and anxiety about future events in that is a common feature of all anxiety disorders (Watson, O'Hara, & Stuart, 2008).

Numerous reasons have been cited for the comorbidity of depression and anxiety such as genetics, other biological causes, personality, and stressful life events (Seligman & Ollendick, 1998). Seligman and Ollendick (1998) report that 33% to 75% of children with a diagnosed depressive disorder also suffer from an anxiety disorder, while only 12% to 17% of children with a diagnosed anxiety disorder had a comorbid mood disorder. Anxiety may also be seen as a strong predictor of depression, as 59% of patients

with a mood disorder reported previously suffering from anxiety (Lepin et al., 1993). Although anxiety disorders are all generally associated with high rates of depression, certain anxiety disorders such as obsessive-compulsive disorder, panic disorder, and post-traumatic stress disorder, exhibit the highest likelihood of being followed by major depressive disorder (Mineka et al., 1998).

Given that the two disorders often occur together, one would expect those with a comorbid expression of anxiety and depression to exhibit greater levels of impairment. Findings reported by Hranov (2007) indicate that people suffering from both depression and anxiety disorders often experience more significant vocational impairment, higher levels of recurrence, and a higher likelihood of suicide than those suffering from a single disorder. The presence of comorbid anxiety and depression has also been found to correlate with higher deficits in executive cognitive functioning and psychomotor retardation (Basso et al., 2007).

Knowing that both disorders can significantly impair the well being of an individual, it is important that practitioners distinguish between the two when addressing each patient's unique expression of symptoms. Recognizing the root of a patient's symptomatology is made even more crucial to therapy when one considers the high rate of suicide in individuals with severe depression (APA, 2000). In order for this to happen, it is imperative that practitioners and researchers alike develop a sound theoretical framework through which to view the disorders. One such well-researched framework is the Tripartite Model of Anxiety and Depression (Clark & Watson, 1991).

Tripartite Model of Anxiety and Depression

The high level of comorbidity between depression and anxiety creates a need to distinguish the two disorders when diagnosing patients. This necessity to differentiate between the two disorders has been the subject of much discussion and research. As noted by Clark (1989), researchers and practitioners generally have viewed the two disorders in five ways: (a) points along a continuum, (b) alternative manifestations of a common disorder, (c) separate disorders with shared subtypes, (d) separate phenomenon that may develop into the other over time, and (e) completely distinct phenomenon.

Research into the nature of mood and mood disorders has occurred for a number of years. According to Marshall, Sherbourne, Meredith, Camp, and Hays (2003), two higher order factors were initially identified to separate the mood states of depression and anxiety: Positive Affect and Negative Affect. Negative Affect reflected the amount of unpleasant arousal and emotional stress that a person experiences. Positive Affect, as defined at this time, reflected a positive mood state where pleasant arousal could occur. These factors originally provided a framework for understanding normal mood states; however, Watson and Tellegen (1985) suggested these factors could help us better understand mood disorders.

Continuing with this vein of research, Clark and Watson (1991) conducted an evaluation of various clinical measures of both disorders. Through statistical analyses of various measures, Clark and Watson noted that a tripartite structure best addressed the issues of diagnosing anxiety and depression. These factors were identified as a general

neurotic factor that underlies both depression and anxiety, a factor specific to anxiety, and a factor specific to depression. The factor identified as specific to anxiety was designated as Physiological Hyperarousal (PH), and the factor identified as specific to depression was designated as Positive Affect (PA). Clark and Watson identified the third general factor as Negative Affect (NA), a construct that underlies both anxiety and depression.

Negative Affect was noted by Watson and Clark (1991) to identify a general negative feeling. Investigation into possible cognitive content correlates for this factor indicate that a high level of NA is associated with worry as it is defined in several diagnostic measures (Beck et al., 2001). Beck and his colleagues also found this factor to be a common factor to both anxiety and depression. This negative mood is common to those afflicted with depression or anxiety as well as several other disorders. It is also important to consider that this general negative mood is not specific.

Positive Affect (PA) is defined as zest for life (Clark & Watson, 1991). Clark and Watson (1991) suggest that this term could be considered synonymous with terms such as active, proud, interested, delighted, etc. They also noted that the absence of PA would be the clinical term anhedonia. Anhedonia is a classic symptom of depression-related mood disorders. Research by Beck et al. (2001) found that a low level of PA is correlated with the construct of hopelessness, which is also recognized as unique to patients with depressive mood disorders. Patients diagnosed with anxiety disorders do not normally

report a decreased level of PA. In this way, a lack of PA signals the presence of depression as defined within Clark and Watson's tripartite model.

Clark and Watson (1991) defined a third factor, Physiological Hyperarousal (PH), as unique to patients displaying anxiety disorders. This specific anxiety factor was noted to focus on feelings of tension, stress, nervousness, shakiness, and panic. Similar to the discriminatory role of PA in depression, Clark and Watson indicated the presence of significantly high levels of PH in a patient would be associated with a diagnosis of an anxiety disorder. Research conducted by Chorpita (2002) suggests that caution should be taken when evaluating anxiety with this model. The results of his studies indicated that PH was only significantly correlated with Panic Disorder.

Originally, the tripartite model was designed to model patterns of anxious and depressive symptoms in adults. Further research has examined the validity of using this model with other age groups. A study by Laurent and Ettelson (2001) compared the results of a number of studies and concluded that the tripartite model could be applied to the diagnosis of these disorders in children and young adolescents. Additional research provided evidence that the model also could be applied to a population of college-aged youth (Joiner, 1996).

Numerous studies have verified the tripartite model or have suggested similar three-factor models with the same construction (Chorpita, 2002; Joiner, 1996; Joiner et al., 1998). In addition, studies such as those conducted by Chorpita (2002) indicate the

need to determine if each factor loads as anticipated on various forms of mood and anxiety disorders.

Given the similar nature of depression and anxiety, it is important that measures exist to aid in discriminating between them. Mental health practitioners currently use a wealth of measures to assess their patients. Although they may provide information regarding the symptoms of a patient, few instruments provide professionals with a sound method to differentiate between depression and anxiety. The Clinical Assessment of Depression (CAD; Bracken & Howell, 2004) is a relatively new measure of depression that has included items that may aid clinicians in discriminating between these two common disorders.

Clinical Assessment of Depression (CAD)

The Clinical Assessment of Depression (Bracken & Howell, 2004) is a brief measure of depression with a wide age range. The CAD has a unique subscale structure which also includes an assessment of anxiety symptoms. Bracken and Howell (2004) developed the CAD to provide mental health practitioners with in-depth diagnostic information and to provide a direction for the design of therapy programs. The CAD measures symptoms of depression and related disorders consistent with the DSM-IV-TR across a wide range of ages (ages 8 to 79). The CAD consists of a 50-item self report questionnaire that uses a four-point Likert-type response scale (*Strongly Disagree*, *Disagree*, *Agree*, *Strongly Agree*). Item responses produce T-scores for an overall depression score and four more specific subscale scores: Anxiety/Worry, Diminished

Interest, Cognitive and Physical Fatigue, and Depressed Mood. The inclusion of these symptomatic subscales sets the CAD apart from previous depression measures. In addition, the CAD includes three separate measures of validity (Negative Impression, Inconsistency, and Infrequency) that were designed to help in the interpretation of patients' responses. The Diminished Interest subscale assesses the presence of anhedonia, lack of interest or excitement in previously enjoyed activities or the future. The Depressed Mood subscale investigates feelings of unhappiness, sadness, and a pessimistic global viewpoint. The Anxiety/Worry subscale measures items that reflect anxiety, worry, and fear. The Cognitive and Fatigue subscale consists of items that assess feelings of physical sluggishness, fatigue, difficulty making decisions, and taking actions that require energy. In addition to its use as a diagnostic tool, the authors of the CAD recommend the measure for use in the planning of a therapeutic program and progress monitoring.

While it includes more dimensions of depressive symptoms than many previous measures, the CAD has been criticized for still not being fully comprehensive in this aspect. Several authors (Aghakhani & Chan, 2007; Kavan, 2007) note that the measure does not address all the symptoms of a major depressive episode. Questions regarding suicidal ideation and weight loss/gain are absent. Other symptoms of depression such as sleep issues, feelings of worthlessness, and psychomotor retardation were covered, but the information provided may not be sufficient for designing treatment plans (Kavan, 2007). Although these drawbacks must be taken into consideration, the CAD remains a

comprehensive inventory of depressive symptoms and its subscale structure offers invaluable information about the expression of depression in respondents.

Standardization of the CAD. The CAD was standardized using a large sample of 1,900 individuals from a large age range in 22 states of the United States of America (Bracken & Howell, 2004). The authors of the CAD noted that this standardization sample proportionally represented individuals according to 2001 census data. Although the authors claim that the composition of the standardization sample is representative of the same census data, Aghakhani and Chan (2007) report that the racial and ethnic demographics were not well described in the CAD manual. The authors of the CAD noted that this standardization sample does not adequately represent adult individuals with eight or fewer years of education.

Reliability of the CAD. Reliability was demonstrated through two different methods: internal consistency and stability. The authors of the CAD defined a reliability of .90 as necessary for using a measure's total score for decision making in a clinical setting. A reliability of .80 was deemed as appropriate for making decisions based on subscales. These criteria are used to elevate the measure's reliability.

Internal consistency was calculated using coefficient alpha. All total score and subtest coefficient alphas met or exceeded the criterion for decision making, .90 and .80 respectively. Across all ages, reliabilities for the overall Total Score (TS) ranged from .95 to .96. Across genders the TS was found to be equally reliable at a level of .97 (Bracken & Howell, 2004). According to Kavan (2007), reliabilities for the total score are strong

and relatively strong for all subscales. Across ages there was slight variance in subscale reliabilities. With its large number of items, the DM subscale was found to possess good reliabilities (from r = .95 to .96). The DI subscale was found to have the lowest overall reliabilities over age groups (r = .78 to .86). Across genders, all four subscales were found to exhibit coefficient alpha reliability levels from .83 to .85 (Bracken & Howell, 2004).

Independent research confirms that the CAD exhibits high levels of reliability. Hicks (2005) indicates the CAD and its subscales exhibit high levels of reliability with coefficient alpha levels which range from .87 to .96. In another study (Jones, Tinsley, & Bowers, 2005), the CAD was found to have a high total score coefficient alpha of .98 and corrected item correlations for subscales which ranged from .81 and .88 for adolescents.

The standard error of measure (SEM) of the TS across age and gender was determined to be quite low and ranged from 1.77 to 1.91. Subscale SEMs ranged from 2.05 to 4.68 with the DI subscale having the lowest SEM range. Low SEMs for this instrument suggest that a respondent's scores on this measure are likely representative of true scores.

Criterion levels for stability were noted to be the same as those for internal consistency (Bracken & Howell, 2004). Two groups were administered the measure twice; a group of 40 children and adolescents and a group of 59 adults. Test-retest reliability was found to be below the .90 criterion, but still strong overall (r = .84). Likewise, test-retest reliability for each subscale fell near the .80 criterion. As Kulstad

(2007) states, all stability scores that were calculated were within one T-score of the .90 criterion. Additionally, test-retest reliability tended to be higher for adults in the sample.

Validity of the CAD. The authors (Bracken & Howell 2004) of the CAD designed the instrument to exhibit good content validity by having items reflect known characteristics of depression in the DSM-IV-TR. Research was also examined in journal articles, psychopathology textbooks, and reference books to obtain a comprehensive view of mood disorders. Measures of criterion-related validity were obtained by correlating the CAD to several well accepted depression measures such as the Children's Depression Inventory (CDI; Kovacs, 1992), the Reynolds Adolescent Depression Scale (RADS; Reynolds, 1987), the Multiscore Depression Inventory (MDI; Bendt, 1986), and the Beck Depression Inventory – Second Edition (BDI-II; Beck et al., 1996). A 75-item pilot version of the CAD was found to have high correlations with the MDI, BDI, and CDI. The current version of the CAD has been found to exhibit a strong correlation with the RADS. Aghakhani and Chan (2007) point out that correlations between total scores on all four measures and the four subscales of the CAD were found to be sufficient. Independent research concerning the CAD confirms good correlations with past well established measures such as the Brief Symptom Inventory (BSI; r = .60 to 1.0; West, 2007), the BDI-II (r = .77; Bowers, 2004), and the RADS (r = .88; Tinsley, 2004). Hicks (2005) reported that correlations between scales of the CAD and the BDI-II are strong. Kavan (2007) stated in his review of the CAD that this measure's correlations with established measures of depression are a strength. Significantly higher scores for

individuals with clinical diagnoses over nonclinical respondents confirmed the CAD's usefulness as a diagnostic tool. Confirmatory factor analysis conducted during the creation of the CAD identified a four factor model as providing the best fit with the CAD (Bracken & Howell, 2004).

In summary, the CAD is a 50-question self report measure designed to assess symptoms of depression, and, to a lesser extent, anxiety. The CAD addresses most of the major symptom areas of depression as noted by the DSM-IV-TR. The authors of the CAD and reviewers (Kavan, 2007; Kulstad, 2007) suggest that the measure has sound levels of reliability, stability, and validity that would make it useful for mental health practitioners in a number of fields. The stability of this test over time was purported to be a weakness for this measure; however, stability scores for the total score and all subscales were not significantly below the desired criterion.

Purpose

Anxiety and depression are very common mental disorders that can adversely impact the social and physical functioning of individuals. These two disorders have often been found to be comorbid, and mental health professionals face great challenges when trying to discriminate between the disorders (Nitschke et al., 2001). According to Davison et al. (2006), 60% of participants diagnosed with an anxiety disorder will experience at least one episode of major depression. Precise treatment of patients with anxiety or depression depends on examining the symptoms that an individual patient presents. This study will examine the utility of a new measure, the CAD, in discriminating between these common disorders.

The BAI and the BDI-II are currently used by many mental health professionals as narrowband measures of anxiety and depression, respectively. Empirical support for both the BAI and BDI-II is evident in the reviewed literature as well as their wide range of use in the mental health profession (Kamphaus, Petoskey, & Rowe, 2000). The CAD represents a comprehensive and narrowband assessment of a variety of depressive symptoms, and its unique subscale structure presents practitioners with the ability to more easily determine the expression of specific categories of symptomatology. In addition, the inclusion of a subscale that measures anxious symptoms may enable mental health professionals to differentiate between patients suffering from depression and those suffering from anxiety and those individuals with comorbid disorders. Using the tripartite model of anxiety and depression as a framework, analysis of the pattern of convergent

and divergent validity between the BAI and BDI, two established instruments, and corresponding subscales of the CAD will be used to examine the CAD's usefulness in discriminating between anxiety and depression.

Hypothesis 1: Like constructs across the CAD, BAI, and BDI-II will produce significant, strong (r = .6 to 1.0) correlations. Please see Table 1 below for similar and dissimilar scale pairings.

Hypothesis 2: Dissimilar constructs across the CAD, BAI, and BDI-II will produce low to moderate (r = .2 to .59) correlations. Please see Table 1 below for similar and dissimilar scale pairings.

Hypothesis 3: There will be a significant difference between the correlations of similar constructs and those of dissimilar constructs.

Table 1

Construct Similarities across the BDI-II, BAI, and CAD

CAD Dimension	Similar Constructs	Dissimilar Constructs
Depressed Mood (DM)	BDI-II	BAI
Diminished Interest (DI)	BDI-II	BAI
Anxiety/Worry (AW)	BAI	BDI-II
Cognitive and Physical Fatigue (CPF)	BDI-II	BAI
CAD Total Score	BDI-II	BAI

Method

Participants

The sample used in this study consists of archived data from a sample of 295 college students ranging in age from 18 to 52 years who were enrolled in psychology courses at a south central Kentucky university. Before further calculations were made, 14 individuals were removed from the sample due to scores of 2 or higher on the CAD Inconsistency Scale. A large portion of the sample (90%) fell between the ages of 18 and 24. Women were more heavily represented than men (74.9% female versus 25.1% male). Sample demographics include 84.1% White, 9.5% Black, 2% Asian, and 4.4% other ethnicities. The majority of the sample consisted of freshman students (41.7%), sophomores represented 20.0%, juniors represented 20.7%, and seniors represented 17.6%. According to self-reports, 38 (2 removed for incomplete measures) participants had previously diagnosed psychological disorders (12.9% of the entire sample). This group comprises the clinical sample. This clinical sample yielded similar descriptive statistics to the total sample. Self reported diagnoses consisted of three main groups: 18 individuals with depression related disorders, 4 with anxiety disorders, 7 with mixed diagnoses of anxiety and depression, and 4 with Attention-Deficit Hyperactive Disorder, and 5 did not specify a diagnosis.

Measures

Clinical Assessment of Depression. The CAD (Bracken & Howell, 2004) is a self-report questionnaire consisting of 50 items that measure a number of symptoms of depression

using a Likert-type Scale with four possible responses (*Strongly Disagree*, *Disagree*, *Agree*, and *Strongly Agree*). The CAD yields T-scores (mean of 50, standard deviation of 10) for the total score and four subscales that measure different dimensions of depression: Depressed Mood, Anxiety/Worry, Diminished Interest, and Cognitive and Physical Fatigue. T-scores one standard deviation above the mean are considered to present a Mild Clinical Risk, those two standard deviations above the mean are considered Moderate Clinical Risk, and those T-scores three standard deviations above the mean or higher are considered to be Significant Clinical Risk. The CAD also includes three validity scales (Inconsistency, Negative Impression, and Infrequency) that provide more specific information about a respondent's symptoms and patterns of response. Reliability and validity of the CAD is reviewed to be good (Kavan, 2007; Kulstad, 2007). This is further supported in independent research (e.g. Bowers, 2004; Tinsley, 2004).)

Beck Depression Inventory – Second Edition. The BDI-II (Beck et al., 1996) is a 21-item self-report measure designed to assess depression symptoms that correspond to the DSM-IV-TR. The BDI-II is a widely accepted measure of depression for both clinical and nonclinical populations from age 13 and up. Camara, Nathan, and Puente (2000) presented survey results that showed that the BDI-II is within the top 15 instruments most frequently utilized by clinical and neuropsychologists. The BDI-II has good internal consistency with coefficient alphas ranging from .92 to .93 and exhibits good three week test-retest stability (r = .93). The BDI-II exhibits reasonable discriminate validity with

measures of anxiety and good concurrent validity with measures of depression (Bowers, 2004; Jones et al., 2005, March; Hicks, 2005; Tinsley, 2004; West, 2007).

Beck Anxiety Inventory. The BAI (Beck & Steer, 1993) is a 21-item scale that assesses severity of anxiety symptoms in adults and adolescents. The BAI is a widely used scale in the evaluation of anxiety-related symptoms in children and youth (Kamphaus et al., 2000). The BAI exhibits a high level of reliability with a coefficient alpha of .94 and test-retest reliability of r = .75. Additionally, the BAI correlates well with the Hamilton Anxiety Rating Scale – Revised (r = .51) and the State-Trait Anxiety Inventory (r = .58; Beck & Steer, 1993). Although, the BAI has low discriminant validity when compared to the BDI-II(r = .48 to .71), it remains a short and highly reliable scale for assessing symptoms of anxiety (Waller, 1998).

Procedure

This study involved the analysis of an archived data sample composed of psychology students recruited through the Student Study Board at a south central Kentucky university. The Study Board is an electronic resource for students to sign up and schedule time to participate in research studies. Additional participants joined this study through classroom sign up in a variety of undergraduate psychology courses not participating in the Student Study Board.

The data collection session involved the completion of a demographic form and the measures for a number studies including the Beck Anxiety Inventory (BAI), Beck Depression Inventory - Second Edition (BDI-II), the Brief Symptom Inventory (BSI),

and the Clinical Assessment of Depression (CAD). After giving consent for the study, respondents provided demographic information and received a packet of measures (CAD, BDI-II, BAI, and BSI). Control of order effects was achieved by systematically varying the order of measures in the data packet. Participants returned completed materials to the administrator and received a debriefing statement along with documentation of credit for participation.

A coding system ensured participant confidentiality by keeping names separated from the data packets. This system allowed for participant identification without including names on the test forms. Participant identification allowed researchers to identify and contact participants in the event of clinically significant responses. If clinically significant responses were noted, participants were contacted by the primary investigator, a licensed psychologist. During the meeting, the primary investigator presented participants with information about depression and resources. The University's Human Subjects Review board approved all procedures along with approval to utilize this archived data for the current study

Results

This section presents analyses addressing the three hypotheses set forth in this study. First a correlation matrix was computed for the total sample each group (nonclinical and clinical; see Appendix A). To address hypotheses 1 and 2, a correlation matrix was compute for the clinical and nonclinical samples. Hypothesis 3 was addressed using a Hotelling-Williams *t*-test to test for the difference in correlations.

Hypothesis 1.

To address Hypotheses 1 and 2 correlation matrices were developed for the nonclinical ($N = 247$) and clinical samples ($N = 38$). All scales and the Total Score from the CAD were correlated with BAI and BDI-II scores. Hypothesis 1 predicted statistically significant strong correlations ($r > .60$) between scales that measured similar constructs. These correlations are found in Table 2 for both the clinical and nonclinical samples. All correlations of similar scales in the nonclinical sample supported Hypothesis 1 by evidencing correlations greater than or equal to .60. In the clinical sample, results also supported Hypothesis 1 with strong correlations with the exception of the BDI-II Total Score with the CAD-Depressed Mood scale (r = .56). All correlations for this hypothesis were found to be significant at the $p < 0.1$ level.

Table 2

Hotelling-Williams Test of Significant Difference between Correlations for Clinical and Nonclinical Samples

		Scale 3 - BAI					
		Nonclinical Sample			Clinical Sample		
Scale 1	Scale 2	r_{12}	r_{23}	t	r_{12}	r_{23}	t
BDI-II	CAD Total	.72	.52	4.82*	.68	.52	1.44
	CAD- CPF	.70	.52	4.34*	.69	.53	1.42
	CAD- DI	.61	.37	5.02*	.71	.33	3.58*
	CAD- DM	.62	.41	4.84*	.56	.38	1.39
	CAD- AW	.66	.61	- .01	.58	.67	.67

Note. $N_{Nonclinical}$ = 247. Clinical $N_{Clinical}$ = 38 Scale 1 refers to the Beck Depression Inventory - II. Scale 2 denotes Clinical Assessment of Depression. Scale 3 refers to Beck Anxiety Inventory. Correlations between scales were significant at $p < .05$ or lower. Hotelling-Williams tests were carried out to test whether correlations between Scales 1 and 2 (r_{12}) were significantly different from those between Scales 2 and 3 (r_{23}).
*$p < .001$; one-tailed.

Hypothesis 2.

Hypothesis 2 predicted low to moderate (.2 to .59) correlations between scales that measured dissimilar constructs. Correlations between similar scales in the clinical sample fully supported Hypothesis 2. Correlations for the nonclinical sample supported Hypothesis 2 except for the correlation between the BDI-II Total Score and the CAD –

Anxiety/Worry subscale (r = .66). All correlations for this hypothesis were found to be significant at the $p < 0.1$ level.

Hypothesis 3.

For each correlation of similar and dissimilar constructs across measures, a Hotelling-William's *t*-test was performed to determine if correlations were significantly different. The results of these *t*-tests for both samples may be viewed in Table 2. Within the nonclinical sample significant differences were found between the correlations between most similar and dissimilar construct scales with the exception of the CAD-AW subscale. A different pattern was evidenced within the clinical sample. The CAD-DI was the only subscale that evidenced significant difference between BAI and BDI-II correlations. The Hotelling-Williams *t*-values for all other comparisons were found to be non-significant for the clinical sample.

Discussion

The purpose of the current study was to explore the CAD's usefulness within the tripartite model of anxiety and depression as proposed by Clark and Watson (1991).To do this, scores on the CAD and its subscales were compared to the BDI-II and the BAI. This study predicted strong correlations (r = .6 to 1.0) between similar constructs and weak to moderate correlations between dissimilar constructs (r = .2 to .59). Additionally, it was predicted that there would be significant differences between dissimilar and similar construct correlations for each CAD scale. The sample was divided into clinical and nonclinical groupings for further investigation. Similar and dissimilar constructs can be viewed in Table 1 of this study.

Hypothesis 1 analyzed the convergent validity of BDI-II and the BAI with similar constructs on the CAD. For the nonclinical sample, all correlations proved to be strong. In the clinical sample, all correlations were found to be strong with the exception of the correlation between the BDI-II Total score and the CAD-DM subscale (r = .56). Although this correlation was found to be moderate in strength, it still fell within the higher level of moderate correlation (r = .50 to .59). The CAD-DM subscale is the largest subscale on the CAD and focuses on feeling of hopelessness, loneliness, failure, and a general sense of depressed mood. This correlation in the clinical sample and the corresponding correlation in the nonclinical sample (r = .62) are lower than the developers found in the standardization of the CAD (r = .75: Bracken & Howell, 2004). Due to the nonclinical nature of the self-selection process, participants in this study may

not have taken care to insure consistent responses between measures. Aside from the single exception, these findings support Hypothesis 1, which predicted strong correlations between the BDI-II and BAI with similar constructs on the CAD.

Hypothesis 2 investigated the divergent validity of the BDI-II and the BAI with dissimilar constructs on the CAD. For the clinical sample, all correlations were found to be at a moderate level as predicted. All correlations for the nonclinical sample were found to be moderate or weak except for the correlation between the BDI-II Total score and the CAD-AW subscale (r = .66) which was strong. Aside from this exception, findings support Hypothesis 2 which predicted weak to moderate levels of correlation for dissimilar constructs on the CAD with the BDI-II and BAI.

The CAD-AW subscale is an 11-question subscale measuring anxiety, worry, agitation, confusion, and fear (Bracken & Howell, 2004). These 11 questions were examined to determine how they fit with the three factors of the tripartite model of depression and anxiety (Clark & Watson, 1991). Six of the questions on the CAD-AW subscale questioned the general level of Negative Affectivity (NA) felt by the participant. Three items on this subscale addressed issues of physical agitation or hyperarousal (PH). Lastly, two questions referred to a participant's level of Positive Affectivity (PA) or level of pleasure in daily activities. The presence of these PA items within this subscale indicates the presence of constructs conceptualized as unique to those that suffer from depression. This may explain the lack of significant difference between correlations of the BDI-II and the BAI with the CAD-AW subscale. In this way, the CAD-AW subscale

does not conform to the structure of the tripartite model of anxiety and depression for both samples. The proportion of items on this subscale identified as assessing PH is not considered large enough to outweigh PA and NA items. As it does not contain enough solely anxiety-related items (PH), this subscale may not differentiate anxiety-related symptoms as purported by the title of the subscale itself. Further, it does not support a tripartite interpretation for this measure.

Hypothesis 3 examined the differences between correlations of similar and dissimilar constructs with the CAD and its scales. A series of Hotelling-Williams *t*-tests were performed to analyze the difference between correlations of similar and dissimilar constructs for both the clinical and nonclinical samples. Significant differences were found for all scales but the CAD-AW subscale in the nonclinical sample. However, the clinical sample evidenced only one significant comparison supporting differences between the correlations of the CAD-DI subscale and the BAI versus the BDI-II. When one considers the heterogeneity of this clinical population, the relatively small clinical sample size and the heterogeneity of the items on the CAD-DI subscale this result is plausible.

Limitations

To interpret the findings of this study, one should bear in mind the limitations. The external validity may be affected by the nature of the sample selection process for this study. Participants came from undergraduate psychology classes at a regional university which serves a limited geographic area. Participants self-selected to participate

or were encouraged to participate through extra credit awarded in a class. This self-selection may pose issues with the internal validity of this study. As all were currently enrolled in college, participants were considered highly educated. Due to their level of education, most participants were likely to have backgrounds in a moderate to high socioeconomic level. According to Bromberger, Harlow, Avis, Kravitz, and Cordal (2004), groups with lower socioeconomic status may experience higher rates of depression. Furthermore, the sample consisted primarily of young, white, female individuals with no self-reported clinical diagnoses. Both the nonclinical and clinical samples would benefit from more representative demographics along the lines of ethnicity and gender.

Although, the clinical sample size was sufficient, a larger number might provide more robust results. The current clinical sample consisted of participants who reported diagnoses of depressive disorders or depressive and anxiety disorders from a community sample. These individuals may not present with a full range of symptoms or severe levels of symptoms that may be present in individuals involved in more intense treatment programs.

Further Research

Future research might focus on expanding on the demographics used in this study. Further studies of the CAD should consider expanding upon groups underrepresented by the current sample such as non-white ethnicities, diverse socioeconomic statuses, males, and older age groups to investigate the generalizability of the current findings for the

CAD. Furthermore, future research might be conducted with a larger clinical sample including individuals with documented clinically significant depressive, anxiety, and mixed diagnoses. Further studies could enhance the generalizability of these findings by including a broader geographical range in the sample. Lastly, other studies may consider using more in-depth measures of depression and anxiety related symptoms. Although both the BAI and BDI-II are psychometrically sound and widely used by mental health professionals, they are brief assessments of symptomatology for their respective disorders. More in-depth measures of these disorders may provide more robust comparisons with the CAD and its factor structure.

Practical Implications

The major implication of this study is that the CAD and its scales correlate well with the BDI-II and BAI; however, the CAD-AW subscale may not provide adequate information for differential diagnosis of anxiety. Assessment noting high AW scores on the CAD needs to be supplemented with additional measures for an accurate diagnosis. The CAD-AW subscale correlated strongly with the BAI in both the clinical and nonclinical samples, but these correlations were not significantly different from those with the BDI-II. Further examination of the CAD-AW subscale revealed the presence of items measuring Positive Affect as defined by Clark and Watson (1991). The presence of this construct may explain the similarity of correlations of the BDI-II and the BAI with this subscale. Due to the small number of questions in this subscale and the findings of this study, diagnosing anxiety using the CAD-AW subscale is not recommended. With a

strong correlation with the BAI, a high score on the CAD-AW subscale should only warrant further examination of anxiety-related symptamology using more specifically designed scales and not as a deciding factor in the diagnosis of anxiety. It appears that the tripartite model of depression and anxiety is not the best conceptualization for interpreting the CAD. However, the scales appear to offer a range of assessment of symptomatology not present in other measures of depression.

Depression and anxiety are disorders that exhibit a great deal of comorbidity (Lepin et al., 1993). Both disorders may significantly impair the well being of an individual, which makes it essential that mental health practitioners distinguish between the two when addressing each patient's unique expression of symptoms. Although the CAD may not provide a significant method of differential diagnosis, it is a sound measure of depression and may reveal the need for further evaluation of anxiety-related symptoms in patients.

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Appendix A

Correlation Matrices

Correlations between Beck Depression Inventory – Second Edition (BDI-II), Beck Anxiety Inventory (BAI), and Clinical Assessment of Depression (CAD) For The Total Sample

Scale	1	2	3	4	5	6	7
1. BDI-IITotal	-	.72	.70	.64	.62	.67	.59
2. CAD Total		-	.89	.88	.94	.87	.54
3. CAD- CPF			-	.77	.74	.81	.53
4. CAD- DI				-	.83	.67	.40
5. CAD- DM					-	.72	.43
6. CAD- AW						-	.63
7. BAI Total							-

Note. N = 38. CPF = Cognitive and Physical Fatigue Scale; DI = Diminished Interest Scale; DM = Depressed Mood Scale; AW = Anxiety/Worry Scale.
All correlations significant at $p < .01$.

Correlations between Beck Depression Inventory – Second Edition (BDI-II) and Beck Anxiety Inventory (BAI) with Clinical Assessment of Depression (CAD) for Nonclinical Sample

Scale	1	2	3	4	5	6	7
1. BDI-II Total	-	.72	.70	.61	.62	.66	.58
2. CAD Total		-	.89	.87	.93	.88	.52
3. CAD- CPF			-	.75	.72	.83	.52
4. CAD- DI				-	.83	.67	.37
5. CAD- DM					-	.72	.41
6. CAD- AW						-	.61
7. BAI Total							-

Note. N = 247. CPF = Cognitive and Physical Fatigue Scale; DI = Diminished Interest Scale; DM = Depressed Mood Scale; AW = Anxiety/Worry Scale.
All correlations significant at $p < .01$.

Correlations between Beck Depression Inventory – Second Edition (BDI-II), Beck Anxiety Inventory (BAI), and Clinical Assessment of Depression (CAD) For A ClinicalSample

Scales.

Scale	1	2	3	4	5	6	7	
1. BDI-II Total		-	.68**	.69**	.71**	.56**	.58**	.59**
2. CAD Total		-	.88**	.89**	.96**	.81**	.52**	
3. CAD- CPF			-	.81**	.75**	.65**	.53**	
4. CAD- DI				-	.84**	.59**	.33*	
5. CAD- DM					-	.67**	.38*	
6. CAD- AW						-	.67**	
7. BAI Total							-	

Note. N = 38. CPF = Cognitive and Physical Fatigue Scale; DI = Diminished Interest Scale; DM = Depressed Mood Scale; AW = Anxiety/Worry Scale.
*p < .05. **p < .01.

Appendix B

Human Subjects Review Board Letter

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

In future correspondence please refer to HS09-036, September 10, 2008

Zane Dempsey
c/o Dr. Elizabeth Jones
Psychology
WKU

Dear Zane:

Your research project, "Differentiating Anxiety and Depression Using 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 not required as all data is being retrieved from a secondary database; (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 Exempt Review Level

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.

Sincerely,

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

cc: HS file number Dempsey HS09-036