Summer 2020

Construct Validity of the Teate Depression Inventory: Convergent and Discriminant Validity and Equivalence for Black/African American and White/Caucasian Samples

Dylin Coons
Eastern Illinois University

Construct Validity of the Teate Depression Inventory: Convergent and Discriminant Validity and Equivalence for Black/African American and White/Caucasian Samples

Dylin Coons

Table of Contents

Abstract

The purpose of this study was to replicate the construct validity of a new measure of depression, the Teate Depression Inventory (TDI; Balsamo & Saggino, 2013), with the primary focus on Black/African American participants. Research has purported that Black/African Americans experience inequality in obtaining mental health care for internalizing disorders. This may partially be caused by errors in diagnosing these individuals with symptoms. Correctly diagnosing internalizing disorders is a critical step in obtaining appropriate treatment. More research on depression and anxiety is needed to enhance mental health practices by addressing the need for professionals to be culturally competent and conscious of the appropriate assessment tools available. To support ethnic minorities, the validity of measurements must be assessed. Research has supported strong psychometric qualities of the TDI, including acceptable construct validity with a small African American sample (Rushworth, 2017).

This study addressed the following research questions: (1) Does the TDI present appropriate construct validity?) 2) Does the TDI have evidence of convergent and discriminant validity with comparisons to General Behavior Inventory (GBI; Depue, 1987) and State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, MacLeod, French, & Locke, 2000): convergent validity coefficients for the TDI and GBI Depression scales showing higher correlations, while discriminant validity coefficients for the TDI, STICSA and the GBI Hypomanic/Biphasic scales showing lower correlations? 3) Is there equivalent convergent and discriminate validity coefficients between the TDI and the GBI depression scale for White/Caucasians and Black/African Americans? 4) Is there similar convergent and discriminant validity coefficients between the TDI and the STICSA cognitive scale for White/Caucasian and Black/African Americans? Participants completed an anonymous survey

using Qualtrics that consisted of the TDI, STICSA, and GBI. Data collected from the present thesis was combined with Rushworth (2016) to provide more stable estimates for convergent and discriminant validity. Results indicated that convergent and discriminant validity supported the appropriateness of using the TDI to assess mental health in Black/African Americans.

Construct Validity of the Teate Depression Inventory: Convergent and Discriminant Validity and Equivalence for Black/African American and White/Caucasian Samples

Introduction

Mental health disorders impact nearly one out of five adults living in the United States (National Institute of Mental Health [NIMH], 2017). Young adults ages 18 – 25 had the highest incidence of poor mental health symptoms (25.8%) compared to adults ages 26 – 49 (22.2%) and 50 or older (13.8%) (NIHM, 2017). The primary focus of this study was to assess the construct validity of the Teate Depression Inventory and to assess construct validity equivalence for Black/African Americans. Awareness of cultural differences and knowledge of potential difficulties can provide a basis for the best treatment for ethnic minorities. Current measures of psychopathology may not have been created objectively and provide questions that may be offensive. Thus, valid assessments for ethnic minorities must be used to rule in and rule out disorders such as depression. There was also the consideration that ethnic minorities might experience and perceive internalizing disorders differently than their non-black peers. The present study examined if the TDI is a valid measure of depression with Black/African Americans.

Internalizing Disorders

Internalizing disorders are mental illnesses where symptomology is not readily observable. Anxiety disorders such as panic disorder with/without agoraphobia, generalized anxiety disorder, post-traumatic stress disorder, specific phobia, social phobia, separation anxiety disorder, and obsessive-compulsive disorder are considered internalizing disorders. Depressive disorders such as major depressive disorder and dysthymia are internalizing disorders as well. Anxiety and depression can be problematic because they are debilitating for an individual.

Individuals who suffer from these disorders have trouble forming relationships, maintaining jobs, and living a functional life (Balsamo, Giampaglia, & Saggino, 2014).

Depression

Depression is a prominent internalizing disorder in the United States. Although most individuals go through periods where they feel "sad," depression is a more intense and debilitating condition that impairs daily functioning. Individuals with depression often have difficulty seeing multiple perspectives on certain situations. They often ruminate on negative thoughts or outcomes longer than the typical person. Other symptoms include: social withdrawal, lack of participation, decreased productivity, insomnia, low energy, low self-esteem, a negative view of the world, and suicidal thoughts (American Psychiatric Association, 2013).

Major depression can result in impairment that can interfere with one's ability to carry out daily life activities. Throughout their lifetime, one major depressive episode with a severe impairment is experienced by 11 million adults ages 18 or older in the United States (National Institute of Mental Health [NIMH], 2017). Several types of depression may occur within an individual. Depression can present within various classifications and diagnoses. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2013) criteria for Major Depressive Disorder (MDD) includes of five or more of the following symptoms: depressed mood for most of the day, loss of pleasure in activities, significant weight loss, insomnia or hypersomnia, psychomotor agitation, fatigue, feelings of hopelessness, inability to concentrate, and suicidal thoughts (APA, 2013). MDD affects the way an individual may think, behave, and feel. Gonzalez et. al (2010) found that the usage of any medical care (psychotherapy or pharmacological) for MDD among African Americans (39%) was significantly less compared to their White peers (59%). Likewise, another study found even

lower rates of services utilized by African Americans. Fortuna, Alegria, and Gao (2010) reported 5.6% of African Americans had four or more mental health visits within 12 months compared to 82.2% of Non-Latino Whites.

Another mood disorder involving depression is Persistent Depressive Disorder (PDD; APA, 2013), also known as dysthymia. According to the DSM–5, (APA, 2013), PDD is characterized by having a depressed mood for most of the day, often, and for at least two years for adults. Diagnostic criteria include poor appetite, overeating, low energy, low self-esteem, and a feeling of hopelessness. Typically, symptoms are less severe than MDD but are longer in duration. Individuals with Major Depressive Disorder existing longer than two years should be given a diagnosis of PDD (APA, 2013). PDD may be less severe than MDD, but still adversely affects a person's life.

Anxiety and depression symptoms may often co-exist. Hirschfeld (2001) found that between 10% and 20% of patients will visit their physician after experiencing anxiety or depression. Further, he found that 50% of those patients diagnosed with co-occurring anxiety and depression, need increased medical attention. A mood disorder that has common symptomology with depression and anxiety is Bipolar Disorder. Bipolar I disorder is described as a persistent, expansive, or irritable mood accompanied by an increased level of energy, insomnia, "racing thoughts," distractible, risky behavior, and grandiosity (Huberty, 2012). Individuals with Bipolar I have at least one manic episode but are susceptible to more. In Bipolar II, symptoms are like Bipolar I, except that a person must have (or had) at least one major depressive episode and at least one hypomanic episode, but no manic episodes (Huberty, 2012).

Individuals with depression report significantly lower quality of life, difficulties in functioning, unemployment, and complications forming social relationships. Manic episodes are characterized by an elevated mood atypical from their normal mood. These behaviors are defined by irritability, distractibility, high-risk behaviors, and an increase in goal-directed activity (APA, 2013). Individuals experiencing manic episodes can display psychotic symptoms. However, hypomanic episodes do not display psychotic symptoms and are less are severe. Hypomanic episodes tend to occur when an individual is switching from mania to depression. When experiencing a depressive episode, these individuals have internalizing symptoms such as hopelessness, intense sadness, and negative feelings about them self.

Research has indicated that it is especially difficult to diagnose African Americans with Bipolar Disorder. Neighbors, Caldwell, and Williams (2007) found that the African American population was over-diagnosed with schizophrenia and underdiagnosed with bipolar disorders. This result was consistent with findings of Chrishon, Anderson, Arora, and Bailey (2012), who found that African Americans are significantly more likely to receive a diagnosis of schizophrenia. Multiple sources have reported that African Americans are less likely to receive an accurate diagnosis of mood disorders (Chrishon et. al 2012; Neighbors et al., 2007; Strakowski et al., 2003). These discrepancies show how African Americans may be misdiagnosed with mental health disorders. The need for establishing an objective measure with reliable diagnostic utility would greatly benefit this community as it would lower the rate of African Americans being misdiagnosed.

Anxiety

Anxiety disorders are the most common type of psychological ailment in the United States (Kessler, Chiu, Demler, & Walters, 2005). According to the National Institutes of Mental

Health, results show that 31% of adults 18 or older experience anxiety disorders at some point in their life. Anxiety involves cognitive processes that are accompanied by repetitive thoughts where an individual anticipates negative outcomes in threatening situations (Huberty, 2014). Anxiety is described as an intense concern about subjective and anticipatory events. The fear component of anxiety is a response to anything that is perceived as a threat. Symptoms of anxiety include restlessness, exhaustion, difficulty concentrating, muscle tension, and lack of sleep (APA, 2013). Anxiety affects millions of individuals and is observed in various forms.

The most common anxiety disorder is Generalized Anxiety Disorder, which is described as an enduring amplification of stress and tension (APA, 2013). Generalized Anxiety Disorder is when an individual experiences excess anxiety and fear, which occurs for more than six months. The generalized anxiety is sometimes referred to as free-floating anxiety. A person with this disorder finds it extremely difficult to control the constant worrying behavior in their life (APA, 2013). The anxious feeling is amplified and accompanied by restlessness, fatigue, poor concentration, irritability, muscle tension, and sleep disturbance. Disturbances related to this diagnosis requires adverse impact on everyday functioning. Most people with this disorder report that they feel anxious and nervous their whole lives (APA, 2013).

Additional anxiety disorders include Obsessive-CompulsiveDisorder, Post-Traumatic Stress Disorder, Panic Disorder, and Specific Phobia Disorder (APA, 2013). The presence of obsessions and compulsions characterize obsessive-compulsive disorder (OCD). Obsessions are recurring and persistent thoughts, urges, or images that are unwanted. Compulsions are repetitive behaviors the individual performs in response to the obsessions that provide comfort and stress relief when they experience obsessive thoughts (APA, 2013). The diagnostic criteria for OCD include the presence of obsessions, compulsions, or both (APA, 2013).

Post-traumatic Stress Disorder (PTSD) is a stress disorder, that emerges following a major stressful event. Stress-related disorders also result in externalizing angry, aggressive s, or dissociative symptoms. The diagnostic criteria for PTSD has five parts. The first part is exposure to actual or threatened death, serious injury, or sexual violence (APA, 2013). This can result in experiencing traumatic events, witnessing it happening to others, learning that someone close to them experienced trauma, or experiencing extreme exposure to aversive details (APA, 2013).

Panic Disorder is when an individual experiences recurring and unexpected panic attacks. A panic attack is an abrupt surge of intense fear and discomfort that is accompanied by at least four of the following symptoms: palpations, sweating, increase heart rate, trembling, sensations of shortness of breath, feelings, of choking, chest pain, nausea, dizziness, chills, paresthesia, and derealization (APA, 2013). Panic attacks must be associated with persistent concern of worry, and maladaptive change in behavior, however, not be caused by physiological symptoms or better explain by another disorder. Prevalence estimates for Panic Disorder in the United States are 2% to 3% in adults and adolescents. Intriguingly, research has found that there are lower rates for African Americans, Caribbean Blacks, and Asian Americans (ranging from .01% to .08%) (APA, 2013).

Another Anxiety disorder is Specific Phobia Disorder. Specific Phobia Disorder has an incidence rate of 7% to 9% of adolescents and adults in the United States. Specific Phobia Disorder is described as marked fear or anxiety about a specific object or situation (APA, 2013). Additional diagnostic criteria include that the presentation of the object incites unproportioned immediate fear and anxiety. The individual seeks to constantly avoid of the object and it causes significant impairment in social situations (APA, 2013).

According to Chapman, Kertz, and Woodruff-Borden (2009), anxiety disorders are reported to have a more chronic effect on African Americans. Chapman et al. reported that African Americans' anxiety is experienced for longer periods and at higher levels of perceived distress, with less adequate treatment than for European Americans. African Americans are twice as likely to be diagnosed with hypertension than their European American peers (American Heart Association, 2007). Anxiety can contribute to creating problematic health conditions or accelerate some illnesses, like hypertension. Research must assess appropriate anxiety measures with the African American population to alleviate serious health conditions.

Prevalence rates of overanxious disorder for African American children (20%) tended to be higher compared to European Americans (12%) when using the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Last & Perrin, 1993). Likewise, Last and Perrin (1993) also concluded that African Americans present more fear than European Americans when given the Fear Survey for Children – Revised. Also, when administered the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985, 2000) African American children had higher total scores than their White peers. Results indicated that African American children reported more concerns regarding war, self-harm, and family than their European American peers. This was also observed when African Americans were compared to Hispanic and Latino children (Anderson & Mayes, 2010).

Risk Factors

A considerable amount of research has been conducted on the underutilization of mental health services by African Americans. Consistently, research has found that 75% of Black children have mental health needs that are unmet and that continue through adulthood (Kataoka et al. 2002). According to Cummins and Druss (2011), Black adolescents are less likely to have

seen mental health professionals after a major depressive episode. Additionally, they are less likely to visit an outpatient mental health center compared to their non-Black peers.

It is important for research to address why African Americans are disproportionally diagnosed with mental health disorders. Urban neighborhoods are often disproportionally populated by African Americans and have been affected by deindustrialization. The departure of factories created impoverished neighborhoods because residents did not have available job sources for steady income (Brookins, Petersen, & Brooks, 1997). Growing up in such communities produces a greater risk of being exposed to stressors that can impair economic security development. Hammock, Robinson, Crawford, and Li (2004) found strong relationships between family stress, poverty, and depression. African Americans growing up in such unfavorable conditions are at greater risk of being diagnosed with long-lasting depression.

Help Seeking and Stigma

Research has found that environmental constraints, demographics, attitudes, beliefs, and affordability influence individuals to seek or avoid mental health services. Negative views about mental health services are one of the leading barriers affecting individuals seeking mental health services. Turner, Jensen–Doss, and Heffer (2015) examined parental attitudes toward mental health using a self-report measure. Their results indicated that African American parents had greater reservations about seeking mental health services for their children than other ethnicities. Garland et al. (2005) found that even when outpatient services were used, African Americans were half as likely to receive mental health services than non-Hispanic White youths.

A variety of factors can produce a lack of trust between the African American community and mental health providers. Mistrust was established when African Americans received mistreatment by previous health care professionals, leading to a lack of utilization of future

services (Powel et al., 2019). Research has emphasized that African Americans mistrust healthcare organizations more than any other ethnicity (Armstrong et al., 2013). This is particularity true for African American men who reported higher levels of mistrust of health care professionals (Powel et al., 2019). Additional studies have indicated that African Americans' mistrust of healthcare professionals also leads to higher dissatisfaction in treatment and underutilization of services (Lukachko et al., 2015).

Disparities in Mental Health

In regard to mental health, African American, Hispanic, and Caucasian groups all have individuals who experience some form of mental illness. However, individuals of various ethnicities report and treat mental illness differently. These differences can be rooted in inequities of services from healthcare providers (Lukachko et. al, 2015; Powell et. al, 2019), differences in insurance coverage, or discrimination by health professionals in clinical encounters. The United States Department of Health and Human Services (USDHHS) conducted a study on racial disparities of men's use of mental health services. Among men, 18-44, non-Hispanic Black and Hispanic men were less likely to report feelings of anxiety and depression than White Americans (USDHHS, 2015). Hispanics and non-Hispanic Blacks were also reported to seek mental health services substantially less than non-Hispanic Whites. A study conducted by the Consortium on Psychiatric Epidemiology Studies (CPES) found that minorities reported mental health symptomology similarly to their White American peers. Additionally, Native Americans are more likely to experience PTSD than their White peers, while African Americans experience more schizophrenic symptoms, which could be explained by misdiagnoses.

The most common type of disparity is the access and use of mental health services. Chrishon et al. (2005) found that race was a substantial factor in psychiatric discharge diagnosis. This presents a concern about the quality of health services minorities may receive. Gonzalez et al. (2010) found that African Americans are more likely to receive low-quality health care compared to other ethnicities. Research has found higher rates of premature termination from mental health treatment programs among African Americans, especially treatments that are not culturally specific (Cooper et al., 2003).

Another disconcerting outcome is that African Americans are more likely to end treatment after only one session (Wade & Bernstein, 1991). Wade and Bernstein hypothesized that a contributing factor is clinicians lack of cultural sensitivity training. Results from their study found that African American women are more likely to participate when their counselors exhibit cultural sensitivity verses no sensitivity training, which was statistically significant. Interestingly, they found that race of the counselor was not statically significant when counselors had cultural sensitivity training during the first, second, and third session. It is important for mental health providers to understand that each culture approaches mental health differently. Being cognizant of these differences can help mental health providers use appropriate services and administer culturally sensitive measures. Wells, Klap, Koike, and Sherbourne (2001) found that 25% of African Americans reported their needs were unmet when receiving services for substance abuse or mental illness. They also found that minorities delay seeking mental health services in the early stages of their mental illness. Marrast, Himmelstrin, and Woolhandler (2016) discovered that African American and Latino children received less outpatient mental health services than their White American peers. Cultural values may play a role in this

discrepancy. For example, minorities may prefer to seek informal mental health treatment such as pastors, parents, friends, and teachers (Marrast, Himmelstrin, & Woolhandler, 2016).

Socio-economic Factors

One cause of these disparities could be based on racial discrimination. A health care provider who possesses biases against their client could result in less effective care. In 2009, 24% of the African American population lived below the poverty line (U.S. Census Bureau, 2009). Low-income areas are more likely to experience a shortage of mental health care providers. Since minorities are more likely to reside in low socioeconomic settings, the opportunities for good quality health care are diminished. Black/African Americans expressed feelings of bias, mistrust, negative stigma, and poor care against mental healthcare.

Assessment Measures

The Teate Depression Inventory (TDI; Balsamo & Saggino, 2013) and the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, MacLeod, French, & Locke, 2000) are newer measures being examined to determine validity in identifying symptoms in ethnically diverse populations. Originally, the TDI was created in Italy to assess major depressive disorder in individuals. It was developed using Rasch logistic analysis and item response theory to address psychometric weakness of other measures of depression. The 21 items are rated on a 5-point ordinal scale and have demonstrated strong empirical support in measuring depression (Balsamo & Saggino, 2014). The TDI was translated and adapted to English to continue examining the validity across different populations. A limited amount of research exists with the TDI and different ethnicities in the United States (Rushworth, 2017; Bunni, 2019).

The STICSA, developed in Australia, would also benefit from more research conducted with a diverse sample. The STICSA, a 21 item self-report scale, was based on the State-Trait

Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) that measured of state *and* trait anxiety originally created by Spielberger (1996). It assesses how an individual feels currently in the present moment and how they usually feel in their everyday life. The STICSA was created to improve the quality of anxiety measurement and replicates the assessment of state and trait anxiety. The main improvement of the STICSA was to assess both cognitive *and* somatic anxiety symptoms.

The General Behavior Inventory (Depue et al., 1989) is a 73 item self-report scale that measures depression and mania symptoms in individuals. Empirical evidence for the GBI has shown that it has strong internal consistency convergent and discriminative validity with bipolar disorder (Depue, Kleiman, Davis, Hutchinson, & Krauss, 1985). However, very limited research has used the GBI with a racially diverse sample.

The goal of the present thesis was to examine the construct validity (convergent and discriminant validity) of the TDI and to determine if there was equivalent construct validity for Black/African American participants. As previously stated, there is an imminent need for assessment of tests to determine psychometric properties and equivalence across subgroups, such as ethnic minorities. In the present thesis, the primary focus was determining the construct validity of the TDI with Black/African Americans by examining convergent and discriminant validity with the STICSA and the GBI.

Literature Review

Teate Depression Inventory

Development and Validity. The Teate Depression Inventory (TDI; Balsamo & Saggino, 2013) was created in Italy to provide a reliable and valid self-report measure of depression. Balsamo et al. (2014) examined the benefits of using a Rasch based model over classical test theory (CTT). Instruments like Beck Depression Inventory-II (BDI-II; Beck, et al., 1996) have psychometric limitations that come from scoring complications. For example, the BDI-II score of (always, a rating of 4) on the question of "suicidal thoughts" has the same statistical weight as a score of always on "feeling blue." However, endorsing “always feeling blue” is less severe than “always having suicidal thoughts.” Certain items are related to a different trait (physical illness) than the one being measured by a weighted unit (Balsamo et al. 2014). Thus, the Rasch model offers for more valid approach to developing instruments. The Rasch model assesses the performance on a measured trait, rather than an accumulation of traits on a depression scale. It utilizes a logistic formula that provides for adequate diagnostic utility. Overall, the Rasch model generates and scores the actual index of a person's level of depression.

The initial item pool of the TDI was based on diagnostic criteria established from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association, 1994) (Balsamo et al. 2014). Expert clinicians, psychiatrists, and psychotherapists were asked to formulate descriptions of depression based on their patients. A total of 152 items were created and underwent an elimination process. Next, a second and independent group of expert clinicians evaluated the 152 items and compared them to the DSM-IV-TR diagnostic criteria (Balsamo et al, 2014). This resulted in 41 items being deleted from the initial 152. Psychometricians independently rated the remaining 111 items

based on if the items adequately measured depression. They concluded that 57 items should be dropped because they were not an accurate depiction of depression. However, three items were considered not comprehensive, so they too were removed, and the final item pool consisted of 51 statements.

The Rasch item trait test was used to see if certain items fit specific characteristics of depression. Utilizing a chi-square, fit residuals between 2.0 and 2.5 had an agreement with the model (Balsamo et al, 2014). The Person Separation Index (PSI) assesses the portion of observed variance that is considered to be true score variance. This identified the power of the measure that differentiates degrees of depression. A PSI with an achieved coefficient of 0.85 was considered a good fit for clinical or individual use. The test of local independence was used to identify items that were unrelated to any other response concerning depression. Also, unidimensionality was assessed to examine that only depression was being measured by the set of items (Balsamo, Giampaglia, & Saggino, 2014). Twenty-one items represented depression and fit the model with residuals between -2.20 and + 1.92. All items were rated on a 5-point ordinal scale ranging from 0 to 4. Out of the 21 items, ten items were positively worded to minimize response bias. The TDI had a PSI of 0.96, a Cronbach's alpha of 0.95, and could effectively discriminate the severity of depression. The Person Separation Index nonclinical sample (M = .144, SD = 1.22) and clinical sample (M = .049, SD = 1.24), was statistically significant. Results indicated that the Rasch model was effective in categorizing individuals with or without depression. Non-clinical participants endorsed fewer items than those previously diagnosed with depression, who endorsed more.

A key component of an appropriate measure is to establish an accurate diagnostic cut-off score. Balsamo and Saggino (2014) assessed diagnostic cut off scores for the TDI. The goal of

this study was to maximize the sensitivity and specificity of TDI. This means they wanted to reduce the chance of committing false positive and false negative decisions and increase diagnostic utility of the TDI. The participants were required to complete the TDI and the Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-I; First & Gibbons, 2004). The SCID–I interview, uses a categorical system to rate symptomology and diagnostic criteria. These algorithms help the interviewer classify symptomology (non-depressed, mildly depressed, moderately depressed, severely depressed). The sample consisted of 125 psychiatric outpatients with a DSM-IV-TR diagnosis of depression. According to DSM-IV criteria, 91 participants experienced a single or reoccurring episode of major depression. Of the 91, 21 patients were classified as mildly depressed, 33 as moderately depressed, and 37 as severely depressed. The remaining 34 participants did not meet diagnostic criteria and were classified as non-depressed.

Three Receiver Operator Characteristic (ROC) curves were used to identify optimal diagnostic cut-off scores of the TDI. The first ROC curve was used to assess cut off scores between the non-depressed groups and mildly depressed. ROC curve Area Under the Curve (AUC) reveals the chance of committing a true positive (sensitivity) and true-negatives (specificity) at each value along the scale as it differentiates the two groups. The two additional ROCs were examined to differentiate between mildly depressed, moderately depressed, and severely depressed. The area under the ROC curve (AUC) is the probability that a random respondent will be accurately assigned to the correct group. Values at or below 0.5 indicate that measurement is functioning only at chance or worse. Values between 0.5 and 0.7 indicate low accuracy, values between 0.7 and 0.9 indicate moderate accuracy, and values between 0.9 and 1.0 indicate high accuracy (Metz, 1978).

Each ROC curve indicated strong diagnostic accuracy in discriminating individuals from different groups. The largest difference was found between the severely depressed group and non-depressed group. The AUC values were interpreted accounting for a 95% confidence interval. When comparing mildly depressed patients to non-depressed patients, the AUC was 0.85, *SE* = 0.07, 95% *CI* = 0.72, 0.98. When comparing mildly and moderately depressed to non-depressed patients, the AUC was 0.87, *SE* = 0.05, 95% *CI* = 0.79, 0.98. Finally, when comparing the three groups to severely depressed patients, the AUC was 0.95, *SE* = 0.07, 95% *CI* = 0.91, 0.98.

The first cutoff point had an accuracy of 0.90, with 85.7% true positives, 5.8% false positives, and 14.2% false negatives. Likewise, the first point had a cutoff of 21, with a sensitivity of 0.86 and specificity of 0.94. The second curve compared mild and moderate to non-depressed individuals. It produced a cutoff score of 35.5 with 0.82 sensitivity, 0.98 specificity, and 0.90 overall classification accuracy. This means the score could accurately identify 81.8% of individuals with depression (true positive). Also, 1.8% were falsely identified as having depression (false positive), and 14.2% were falsely identified as not having depression (false negatives). The last cut-off score was 49.5, which produced 0.81 sensitivity, and a 0.94 specificity. Overall classification accuracy was 0.88, with 81.1% true positives, 5.7% false positives, and 18.9% false negatives.

Balsamo (2013) reported results for interpreting TDI cut off scores. Individuals considered to have minimal depression would produce scores between 0 to 21. Those who had scores between 22 to 36 were classified with mild depression. Scores of 37 to 50 showed moderate depression, and scores 51 to 84 indicated severe depression.

Construct Validity of the TDI

Bjork, Dougherty, and Moeller (1997) found that anger, anxiety, and depression produced three positive correlations. Participants were asked to complete the Beck Depression Inventory-II and the Point Subtraction Aggression Paradigm (PSAP; Cherek 1981). The PSAP is a measure of aggression that's guised as a video game where participants play against a fictional opponent. Their results suggested that anger and depression might share common neurochemical etiology. Balsamo (2010) conducted a study on the association between anger, depression, and rumination. This study was conducted with a community sample of 353 Italian adults who were given the Trait-Anger scale of State-Trait Anger Expression Inventory (STAXI-2; Spielberger, 2013), Beck Depression Inventory-II, and Padua Inventory (PI; Burns, 1995). The STAXI-2 was used to assess the tendency to experience and express anger without being provoked. When using the Padua Inventory, only Impaired Control Over Mental Activities (or Tendency to Doubt and to Ruminate) subscale was used. Balsamo (2010) found that scores from Tendency to Doubt and to Ruminate scale correlated moderately with Trait Anger $r = 0.48$, $p < .001$, when controlling for depression. When controlling Trait Anger, Tendency to Doubt and to Ruminate scale correlated with Depression $r = 0.41$, $p < .01$. When controlling for Tendency to Doubt and Ruminate, Depression and Trait Anger correlated 0.13, $p < .014$. Her findings supported a relationship between anger, depression, and rumination. Rumination, regarding depression and anxiety, was defined as repeated negative thoughts. Thus, Balsamo (2010) concluded that anger prone individuals who ruminate might be at risk for depression.

Balsamo (2013) further investigated the relationship between anger and depression by predicting that anger mediates depression. Thus, trait anger could help explain how or why depression is related to low self-compassion (Balsamo, 2013). The study consisted of 230

undergraduate psychology students from an Italian university. All participants were administered the STAXI-2, BDI-II, and Temperament and Character Inventory-Revised (TCI-R; Cloninger et al; 1999). The STAXI – 2 was developed to assess anger without any specific aggravation. The BDI-II is the most wildly used questionnaire to report depression and the TCI–R is used to assess personality dimensions. Balsamo's results indicated that trait anger and depression correlated r = .48 (p < .001). The TCI–R harm avoidance, persistence (r = -.15), cooperativeness (r = -.30), and self-transcendence (r = -.17) had negative correlations with depression was not statistically significant.

Balsamo, Carlucci, Sergi, Murdock, and Saggino (2015) examined the role of co-rumination and depression in young adults. They defined co-rumination as repeated and reoccurring negative thoughts about an ongoing problem. The study included of 461 individuals between the ages of 18 and 38. Each participant received the Co-Rumination Questionnaire (; CRQ; Balsamo, Carlucci, & Saggino, 2016), TDI, and Young Schema Questionnaire Long Form-Third Edition (YSQ-L3; Young, 2003), designed to measure early maladaptive schemas. Results supported previous literature in finding a significant relationship (r) between depression and co-rumination, explaining that the relationship between co rumination and depression may create negative cognitive schemas. Additionally, they found that when scores increased on the YSQ-LS, scores also increased on the CRQ, signifying a positive relationship between the two.

Balsamo et. al (2013) also examined cognitive vulnerabilities and how they related to depression. Cognitive vulnerability was defined as an individual's negative interpretation when perceiving a stressful event. Balsamo et al. (2013) argued that cognitive vulnerabilities play a key role in how individuals develop and maintain depression. Four hundred sixty-seven young adults participated in this study and were administered the BDI-II, the Beck Hopelessness Scale

(BHS; Beck, Weissman, & Trexler, 1974), Life Orientation Test-Revised, and the Attitudes Towards Self – Revised (ATS-R; Innamorati et al, 2013). The LOT–R is a 6-item scale that measures optimism, while the ATS –R measures the vulnerabilities of depression. Balsamo et al. (2013) used the scree test and Velicer's MAP test and found support for four factors. These factors were Optimism, BHS pessimism, Generalized Self-Criticism, and LOT–R Optimism. Two higher-order factors, Optimism (43% variance) and Pessimism/Negative Attitudes towards Self (37% variance), accounted for correlated first-order factors. Discriminating between severities of depression, Generalized Self–Criticism differentiated individuals with moderate to severe depression from other individuals.

Balsamo et. al (2015) used the TDI to examine the construct validity of the Other as Shame scale (OAS; Goss, Gilbert, & Allan, 1994). Shame was defined as the feeling of social rejection or fear that your social status is threatened. It is important to distinguish that shame can be internal (self-feeling or evaluation) or external (negative evaluation from others). The study included 687 participants who were administered the OAS, a global measure of how they believe others evaluate them, the BDI-II, and the TDI. Balsamo et al. (2015) estimated correlations between the OAS and the TDI and the BDI–II to compare appropriate scales. The three first order OAS factors were significantly correlated with the BDI–II and the TD, inferiority (r_{TDI} = .44, r_{BDI} = .41, $p < .01$), emptiness (r_{TDI} = .48, r_{BDI} = .41, $p < .01$), mistake (r_{TDI} = .30, r_{BDI} = .32, $p < .01$).

General Behavior Inventory

Development. The General Behavior Inventory (GBI; Depue, 1987) is an instrument that was developed to assess depressive and hypomanic symptoms in adults. This instrument is commonly used to classify individuals with bipolar disorder. The GBI consists of 73 items that require

respondents to use a 4-point ordinal scale to express the severity of their symptoms. Individuals who obtain higher scores on the GBI are considered to have increased psychopathology. Originally, the GBI was developed with a predominantly White sample. There is evidence that the GBI has shown strong internal consistency and convergent and discriminative validity (Depue et al., 1989).

Depue et al. (1985) examined the use of the GBI for analyzing cyclothymia as a sign of bipolar disorder. Cyclothymia is described as an individual who experiences less severe episodes of depression and hypomania. Some literature has indicated that bipolar disorder and cyclothymia may share the same genetic influence (Akiskal, 1981; Turner & King, 1983; Waters, 1979; Wetzel, Cloninger, Hong, & Reich, 1980). This is due to individuals with bipolar disorder and cyclothymia having a substantial increase of cortisol than other individuals, thus sustaining the relationship between the hypothalamus and mood disorders.

Depue et al. (1985) used the GBI to identify individuals with cyclothymia from a university sample. The GBI was given to 850 university students; and 126 random participants from the 850 who were assessed with the Schedule for Affective Disorders and Schizophrenia, Lifetime Version (SADS-L; Kaufman, 1997). The 126 randomly selected participants (out of 850 respondents) participated in a blind interview using the SADS-L. While the others completed the Research Diagnostic Criteria (ROC) that identified 59 participants with Cyclothymia and 56 subjects with no diagnosable disorder. Then, 15 randomly selected cyclothymic participants and 7 participants who had no psychological diagnosis were asked to continue in the study. To gather a baseline for depression, each participant completed the BDI prior to the study. The study was conducted from 1:00 to 4:00 in the afternoon when normal cortisol secretion takes place for all individuals.

During the study, the participants received a venipuncture and then were allowed to rest for 1 hour. This was to mitigate the stress the subject could experience after receiving a venipuncture. The participants were introduced to a 30-minute stressor, a tedious math problem, followed by a 90-minute recovery and relaxation period. After the 90 minutes, they were asked to complete another math task. Participants with Cyclothymia had significantly greater levels of serum-free cortisol, thus revealing how poorly modulated cortisol was in this group. Once life events and math tasks were accounted for, there was more variation between the participants in the cyclothymic group than the control. Additionally, the GBI items that reflected depression strongly correlated with cortisol levels ($r = .42$, $p < .05$). This relationship was the highest when measuring the recovery period ($r = .78$, $p < 0.01$).

To further examine the groups, discriminant analysis was performed with all participants, significantly differentiating 3 groups (control participants, subgroup of low cyclothymic participants that somewhat overlapped the control, and the subgroup of high cyclothymic participants). During recovery, discriminant function analysis revealed a higher level of cortisol secretion and slower modulation. Altered circadian cycles were demonstrated by participants with Cyclothymia who secreted twice as much cortisol than those with no diagnosis. The average cortisol secretion level for the cyclothymic group ($M = 6.34$, $SE = 1.26$) was twice as high as the control group ($M = 2.67$, $SE = 0.25$). The results from this study further established the GBI's ability to correctly identify individuals with bipolar disorder, based on their biological evidence (Depue et al., 1985).

Utility. Wold (1990) discussed the benefits of using the GBI as a potential screener for affective disorders and compared the GBI to other brief inventory measures to better assess the symptoms of their internal disorder. Wold asked 98 patients to complete the Beck Depression

Inventory and the General Behavior Inventory and compared diagnostic accuracy. The GBI could correctly identify 20 out of the 22 (91%) patients who were diagnosed with Bipolar. However, the BDI correctly identified only 15 (69%) because the BDI items do not measure symptoms of hypomania. The BDI correctly identified more individuals with major depression disorder (89%) than the GBI (75%). These results support the ability of the GBI to accurately identify individuals with bipolar and unipolar disorders. The GBI correctly identified 89% of adjustment disorders exceeding the BDI which could correctly identify 55% of participants. Wold's (1990) results indicated that the GBI would be an appropriate screener for identifying patients with bipolar disorder.

Barr, Makowitz, and Kocsis (1992) used the GBI as a screener for chronic depression, and dysthymic disorder. Dysthymic disorder is classified as individuals who chronically experience depressed mood, low energy, decreased interest or pleasure, and other unbearable symptoms for at least 2 years. Considering the debilitating effect this disorder has on individuals, it is beneficial to have a reliable measure to detect this disorder. Since depressive symptoms tend to be internalized, they usually go untreated, however, dysthymia has been shown to be responsive to treatment.

Barr, Makowitz, ad Kocsis (1992) studied of two groups of patients who had been receiving treatment at a clinic. The first group included 59 patients who completed the GBI. Additionally, 15 of those patients received a blind interview using the Structural Clinical Interview for DSM-III Patient Version (SCID-P; Spitzer & Williams, 1989) to classify their DSM-III diagnosis. The second group included of 59 outpatients who were newly admitted to the clinic and offered the GBI. Only 28 out of the 59 completed the GBI and the SCID-P and entered a pool with the patients from the first group. The patients who received both the GBI and the

SCID-P were used to examine the sensitivity and specificity of the GBI. Patients in this study either had dysthymia (49%) or another mood disorder that was not dysthymia (48%). Results indicated that the GBI had a sensitivity of 61%, a specificity of 88% with a positive predictive power value of 76.9% and a negative predictive power value of 73%. Overall, the sensitivity of 61% was not strong enough to use the GBI as a screening tool for dysthymia. The sensitivity was too low compared to the 49% of patients who had dysthymia.

A study by Youngstrom, Findling, Danielson, and Calabrese (2001) examined the GBI as a measure for parents to report their child's depressive and or hypomanic/biphasic symptoms. Information provided by parent reports is essential in understanding the child's developmental history, mental health, and reoccurring behaviors. Parents witness their children's feelings based on their behaviors which is easier to measure. Bipolar disorder is a very serious disorder and is hard to diagnose because it has similar symptoms with ADHD, depression, and mania. However, each disorder requires different forms of treatment, thus exemplifying the need for an accurate diagnosis.

The GBI is a self-report measure for adults, but Youngstrom et al. (2001) adapted the measure so parents could describe the psychiatric functioning of their child rather than the child self-report. Parents were asked to report information on hypomanic, depressive, and biphasic symptoms for their child. The GBI has evidence that it is an appropriate measure for depressive and hypomanic symptoms with internal consistency greater than 0.85 (Depue, Krauss, Spoont, & Arbisi, 1989). Specifically, Youngstrom et al. (2001) asked the following research questions: (a) does the measure description conform to a two-dimensional model, (b) do the scales meet established criteria for internal consistency, (c) does it show differential diagnosis, and (d) does the parent report correlate with the child's self-report?

Factor analysis was conducted to test the adequacy of a two-scale factor. Based on the existing structure, 73 items were grouped into 20 parcels of three or four similar items. Eight parcels were anticipated to measure hypomanic or biphasic symptoms. Additionally, 12 parcels were expected to assess depressive symptoms. Horn's parallel analysis was used to retain the appropriate number of GBI factors. The first factor had an eigenvalue of 12.68, while the second factor had an eigenvalue of 1.76. All additional factors had eigenvalues lower than one, rendering them unimportant. These results matched well with the initial two-factor model that was identified by Depue (1985). Factors were rotated obliquely because it allows factors to be correlated. Biphasic items showed loadings on both factors as predicted. Depressive factors accounted for 61% of the variance, while hypomanic/biphasic accounted for 7.5% of the total variance, and the two factors were moderately to highly correlated (r = .70) so oblique rotation was necessary. For ordinal scoring that ranged from 0 to 3, the Depression scale had a Cronbach's alpha of .97. Also, the Depression scale had a Cronbach alpha of .95 for binary scoring that consisted of 0 or 1. The standard error of the difference revealed changes of 13 points or more on the Depression Scale and 11 points or more on the Hypomanic/Biphasic scale, for α = .05.

Youngstrom et al. (2001) investigated the discriminative validity of the GBI parent report as an accurate measure of children's bipolar symptomology. Participants were classified into five different groups (no diagnosis, disruptive behaviors, unipolar mood, bipolar I, and other bipolar) based on their independent diagnosis. Results indicated significant group differences on Depression scale and Hypomanic/Biphasic. Logistic regression revealed that the Depression scale significantly differentiated any mood disorder and no mood disorder or no diagnosis. Additionally, the Hypomanic/Biphasic scale discriminated bipolar spectrum and disruptive

behavior, and bipolar spectrum and no diagnosis. Results indicated significant chi-square values with R^2 estimates between 0.45 and 0.81. Overall, both Depression and Hypomanic/Biphasic scales were accurate in distinguishing between unipolar and bipolar spectrum mood disorders.

Lastly, ROC analysis was used to determine the diagnostic utility of the GBI Depression scale and the Hypomanic/Biphasic scale. ROC was adapted and recreated for biostatistical purposes to use with psychological data for research studies (Swets, 1992). To determine the accuracy of the measure, scores account for significant area under the ROC curve. Diagnostic performance is considered low accuracy with AUCs of .50 - .70. Medium accuracy is achieved with AUCs that range between .70 - .90 and high accuracy is achieved with AUCs of .90 – 1.00 (Swets, 1988). All five comparisons (no diagnosis, disruptive behaviors, unipolar mood, bipolar I, and other bipolar) had medium to high accuracy except for unipolar and bipolar depression. The Depression scale was only accurate 40% of the time when differentiating between the two disorders. The Depression scale and the Hypomanic/Biphasic scale had high accuracy with an AUC of .98 and .94 in classifying any mood disorder vs no diagnosis. Both scales had an AUC of .97 when classifying individuals with Bipolar disorder or no diagnosis. When distinguishing between any mood disorder and no mood disorder, the Depression scale (AUC = .88) and the Hypomanic/Biphasic scale (AUC = .81) achieved medium accuracy. The Hypomanic/Biphasic scale obtained medium accuracy with an AUC of .81 differentiating unipolar depression and bipolar disorder. Overall, the investigation of the parent GBI ratings had sound psychometric properties and real-world practicality in correctly identifying bipolar disorder. The results indicated that the GBI could be used as a parent report for providing trustworthy information (Youngstrom et al., 2001).

Findling et. al (2002) examined if the GBI could distinguish meaningful differences

between young patients with mood disorders from children and adolescents with no mood disorders, with specific focus on if the GBI could identify bipolar disorder from self and parent reports. Individuals between the ages of 5 and 17 were asked to participate in this study. Participants who had a diagnosis of pervasive developmental disorder (PDD), a psychological disorder that is caused by a medical condition, or intellectual disability were not admitted to the study. Parents and children completed either a Schedule for Affective Disorders and Schizophrenia for School-Age Children – Epidemiologic version (K-SADS-E; Kaufman et al., 1997) or the Present and Lifetime version (K-SADS-PL; Kaufman et al, 1997). After completing the diagnostic assessment, participants were grouped as Bipolar I disorder, unipolar depression, disruptive behavior, and no diagnosis. Additionally, parents and children completed the GBI to report on the child's behavior. The two GBI scales had the same internal consistency estimates for both the adolescent and parent report. The Depression scale items had an alpha of .97 (parents) and .96 (self-report). Also, the Hypomanic/biphasic scale items had an alpha of .96 (parent) and .94 (self-report).

Findling et. al (2002) examined accurate cut off scores by assessing both specificity and sensitivity. They also examined the positive predictive power and negative predictive power of the GBI. To be practical for clinicians and researchers, two sets of cut off scores were developed with a 90% specificity and sensitivity. ROC curves were analyzed to measure the highest probability the GBI could differentiate the subgroups. The parent GBI report achieved an AUC of .88 while the self-report achieved an AUC of 0.82. The cut off score for the Hypomanic/Biphasic scale was 17, indicating it could correctly classify youth with bipolar 90% of the time. Likewise, the Depressive scale cut-off score of 36 could correctly identify an individual with bipolar disorder 90% of the time. These results supported the GBI could be used

as a parent report and a youth self-report (Findling et. al 2002).

Predictive and Diagnostic Validity. More recently, Pendergast et al. (2015) examined the GBI's ability to differentiate bipolar disorder and ADHD. Research has indicated that it takes an individual 5 to 15 years to receive a formal diagnosis of bipolar disorder. As previously stated, there is difficulty being able to differentiate overlapping symptoms from other disorders such as unipolar depression, anxiety, ADHD, and cyclothymia. Failure to report hypomanic symptoms causes individuals to be diagnosed as unipolar depression, directing them to receive inappropriate treatment. Antidepressants do not alleviate hypomanic or manic symptoms and could potentially make them worse (Pacchiarotti et al., 2011). Thus, it is vital for individuals to be diagnosed correctly to receive necessary treatment. In children, bipolar disorder can look similar to ADHD and when untreated could produce dangerous behaviors (suicidality, substance abuse, and increasing severity in overall symptoms). When misdiagnosed with ADHD, children with bipolar may receive stimulant medication that is potentially harmful (Yatham et al., 2005; Corren, 2008)

Research supports the GBI with a sensitivity of 0.78 in correctly identifying bipolar disorder and specificity of 0.98 in deciding if an individual does not have the disorder (Depue, Krauss, Spoont, & Arbisi, 1989). The GBI Depressive Scale separates individuals who have a mood disorder from those with no mood disorder. Likewise, the Hypomania/Biphasic Scale has a high accuracy in distinguishing between bipolar disorder and unipolar depression (Depue et al 1989). The GBI has been examined with various age groups. Pendergast et. al. (2015) studied the predictive power and diagnostic utility of the GBI with young adolescents ages 14 to 24.

Pendergast et al. (2015) studied of 359 adolescents between the ages of 14-19 who were asked to complete the Schedule of Affective Disorders and Schizophrenia – Lifetime Version

Expanded Edition (SADS-L; Spitzer, 1979) and the GBI. The SADS-L was given to each participant to better understand depression, hypomania, cyclothymia, eating disorders, ADHD, and acute stress disorder. The interrater reliability for the SADS-L was high with values exceeding 0.96 and 0.93 for mood disorders. Young adult participants could complete the GBI on their own time while the adolescent sample was asked to complete the GBI during their visit to the research lab.

Participants were grouped into 4 categories based on the results from the SADS-L expanded edition; bipolar spectrum disorder, unipolar depression, ADHD, and those who had any of the previous disorders. Logistic regression analyses showed that the GBI could distinguish between 6 different categories (individuals with BD versus no diagnosis, those with any mood disorder versus those without, individuals with BD versus those without, individuals with BD versus those with any other diagnosis, individuals with BD versus those with UPD, and individuals with BD versus ADHD. Logistic regression revealed that the GBI could successfully differentiate bipolar disorder and other conditions, particularly, for the hypomanic/biphasic scores between bipolar and unipolar depression (R^2 =.13, $p < .001$) and between bipolar and no diagnosis participants (R^2 =.33, $p < .001$). Likewise, ROC analyses displayed strong evidence that the hypomanic/biphasic scale was beneficial in distinguishing between the bipolar disorder and unipolar depression.

Diagnostic likelihood ratios (DLRs) derived from scores from the hypomanic/biphasic scale were used to categorize the groups into low, moderate, or high. Odds were increasingly high when individuals with bipolar disorder were compared to those with no diagnosis and individuals with ADHD. Another finding was that individuals with ADHD who had GBI Hypomanic/Biphasic scores of 20 or higher were 5 times more likely to be diagnosed with

bipolar when using the Schedule for Affective Disorders and Schizophrenia—Lifetime (Exp–SAD-L; Endicott, 1987) interview. Again, the GBI has been shown to be a valid measure to be used with a young adult for establishing a differential diagnosis. However, the GBI includes language that could only be understood by individuals who have a reading level between 11th and 12th grade, therefore, precludes use with participants who have a lower reading level than 11th grade completing taking the GBI. As previously examined by Findling et al., (2002), the GBI can be used as a parent report for younger individuals (Pendergast et al., 2014).

O'Garro-Moore, Adams, Abramson, & Alloy (2015) examined the GBI's abilities in measuring an individual's symptoms of bipolar with comorbidity of anxiety. The study found that maladaptive cognitions (extreme sociotropy, dependency, self-criticism, and perfectionism) exacerbate an individual's depressive symptomology and anxious thoughts can exacerbate an individual's depression. The combination of anxiety and mood disorders can have a debilitating effect on one's original diagnosis, thus demonstrating the importance of a differential diagnosis. Pendergast et al (2015) found the GBI to a suitable measure for both Black/African and White/Caucasian young adults. The GBI had strong accuracy in recognizing symptoms of bipolar across all diverse groups. In summary, the GBI has adequate psychometric properties in identifying bipolar disorder and the capability to distinguish bipolar disorder from other disorders.

State Trait Inventory for Cognitive and Somatic Anxiety

Development and Validity. Ree, French, Macleod, and Locke (2008) sought to create a scale to improve upon the STAI. The State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, French, MacLeod, and Locke, 2000) is a self-report measure that assesses multiple components of anxiety. The STICSA contains somatic symptoms: hyperventilation,

sweating, muscle tension, or trembling and cognitive symptoms: negative thoughts characterized by excessive worry, intrusiveness, and obscured focus. Initially, there were 131 items considered as suitable descriptions of cognitive and somatic anxiety. Ree et. al (2008) found 62 items as appropriate and these items were written in the first person using an ordinal rating scale. The State scale is administered first, followed by the Trait scale. Trait items were rated with ordinal frequency (i.e. almost never, occasionally, often, almost always) and State items were rated with the ordinal intensity of the feeling (i.e. not at all, somewhat, moderately so, very much).

Items were retained that had a mean score above 1.24 and below 3.75. To reduce redundancy, items that correlated above .45 with other items on the same scale were assessed to determine if they could be explained by similar content. If possible, the researchers kept items with a closer midpoint range. Ree et al. (2008) retained 26 items after removing items that seemed redundant or caused ceiling or floor effects. A confirmatory factor analysis (CFA) was conducted using a Weighted Least Squares (WLS) method of estimation (Joreskog & Sorbom, 1993). The CFA determined that a correlated two-factor model was the best fit for trait anxiety.

To further asses the overall fit of the model, chi-square: degrees of freedom ratio, and a root mean square error of approximation (RMSEA) were examined. Results indicated that the chi-square: degree of freedom ratio was large for a one-factor model (above 5.0) but low for a two-factor model. Thus, yielding large and significant differences between the two models, (χ^2 (1) = 711.13, $p < .001$) in favor of the two-factor model. One somatic item and four cognitive items were deleted for loading on both factors (cross loading). The chi-square indicated significant results for the correlated two factor model and the orthogonal two factor model, however, the correlated model was favored. There was 34% shared variance for cognitive and somatic factors with internal consistency reliability coefficients of .87 and .84, respectively. The

cognitive scale had an internal consistency reliability coefficient of .90 and the somatic scale had a coefficient of .88.

According to Cronbach and Meehl (1955), a psychological measure of constructs requires repeated evaluation and comparison with related and unrelated constructs to establish construct validity. A second study (Ree et al, 2008) was conducted to determine whether the factor structure of trait and state scales could be replicated. All items loaded on the appropriate factor for trait anxiety and had correlation coefficients between .66 and .94, ($p < .01$). The internal consistency reliability coefficient of the Somatic scale was .94 ($p < .01$). Also, the Cognitive scale had a reliability coefficient of .95 ($p < .01$). Ree, French, Macleod, and Locke (2008) found that the correlated two-factor model was the best fit. The chi-square ratio also was in favor of the correlated two-factor model and was statistically significant.

There was a high level of reliability of scores for the State and Trait anxiety scales. Internal consistency coefficients for the State Cognitive dimension was .94 ($p < .01$) and .92 ($p < .01$) for the somatic dimension. Again, confirmatory factor analysis showed that the correlated two-factor model was the best fit for the data, further supporting the validity of the structure. In addition, convergent and divergent validity of the STICSA was also examined with measures of anxiety and depression. Results from the Fisher Z transformation indicated that the STICSA scores converged with State-Trait Anxiety Inventory (STAI; Spielberger & Sydeman, 1994), more than with measures of depression such as the Beck Depression Inventory-II.

Ree, French, Macleod, and Locke (2008) also investigated the predictive validity of the STICSA's trait scales. Specifically, they examined if state scales could distinguish an increase in anxiety in an anxious situation. College students were recruited and asked to complete the STICSA at the beginning of the semester to establish a baseline for comparisons during final

exams to consider predictive validity. A three-way repeated measures analysis of variance (ANOVA) was conducted for main effects and interactions. There was a significant two-way interaction between the time of the assessment and the type of questionnaire. These results indicated that the mean state anxiety scores were higher at final exam time than at baseline. Additionally, there was no significant difference in trait anxiety scores from baseline to high-stress time. Their prediction was accurate and found that mean Cognitive scores were higher than mean Somatic scores during the examination period. Also, there was no significant difference between trait scores at baseline or during their exams. This supported the researcher's initial hypothesis that trait scale scores remain stable during stressful situations.

Overall, Ree, French, Macleod, and Locke (2008) found that the Trait Cognitive scale at baseline predicted an increase in both State Cognitive and Somatic scores during the examination period. This differed from the trait Somatic scales at baseline which did not predict an increase in state Cognitive or Somatic scores at the end of the semester final exam testing. Their results suggested that trait Cognitive anxiety may present a weakness in identifying experiences in general state anxiety in response to cognitive stressors. Likewise, Trait Somatic anxiety may present a weakness to identify experiences in general state anxiety in regard to Somatic stressors. The STICSA has been able to predict when Cognitive and Somatic scales of the STICSA predict a state anxiety response.

Lastly, Ree, French, Macleod, and Locke (2008) further assessed the predictive validity of state anxiety responses to a cognitive and somatic stressor. Their study focused on whether the Trait Cognitive scale could predict cognitive stressors. Again, the researchers used academic stress as the cognitive stressor and the somatic stressor was inhaling CO_2-enriched air. A two-way repeated measures ANOVA revealed a main effect for time of the exam, baseline versus

stress, as well as a main effect the anxiety dimension. Ree et. al (2008) found that there was no interaction between the time of assessment and the type of anxiety the participant exhibited. When measuring the causes of somatic stress, multiple regression analysis was conducted and revealed that the Trait-Cognitive scores at baseline predicted a significant amount of additional variance in State-Somatic scores, total R^2 = .31; State Cognitive scores, total R^2 0.37 at the stressful exam time.

Lancaster, Melka, Klien, and Rodriguez (2015) examined the convergent validity and factor structure of the STICSA with African Americans and European Americans. The study consisted of 514 undergraduate students from a rural Midwestern university. Of 514 undergraduate students, 169 were African American, 269 were European American and 76 were from ethnic groups that were not the primary focus of the study. Several measures were used to compare to the STICSA and mean differences between groups were assessed with independent *t*-tests. Using paired samples *t*-tests, within group differences between cognitive and somatic anxiety were compared for African Americans and European Americans. Results indicated that African American participants had higher scores on State Cognitive anxiety, and Trait Cognitive anxiety, compared to Somatic anxiety. Likewise, European Americans had significantly higher levels of Trait Cognitive anxiety. Additionally, one item ("I think that others won't approve of me") showed a low standardized regression weight in two estimations, State (0.396) and Trait (0.402). Also, the Trait Cognitive score of the STICSA was strongly related to depression (r = .72). It also suggested that the Cognitive component of the STICSA may be a more appropriate measure of anxiety for African Americans than European Americans.

Overall, their results were consistent with previous findings that found the STICSA may be an appropriate measure of anxiety for ethnic minorities. Results also indicated that it failed to

show discriminant validity with a high correlation between depression and social anxiety. Williams, Peeters, and Zautra (2004) found similar correlations between the STAI and a depression measure (.76 and 63) for African Americans and European Americans, respectively. In conclusion, STICSA has evidence to support strong convergent validity and structural validity.

Construct Validity of the STICSA

The Geriatric Depression Scale (GDS; Yesavage et al., 1982) had the highest correlations with the STICAS (r = .56) compared to all measures of depression. This may suggest that the STICSA and the GDS have items that measure Cognitive traits of anxiety similarly. Their findings also reported a negative correlation between the Health Survey (Ware et al., 1996) and the STICSA, demonstrating that an increase in anxiety leads to a poorer quality of life. Balsamo et al (2015) stated that the main benefit of using the STICSA with elderly patients is that it can discriminate between physical anxiety symptoms and medical conditions.

Current literature on the STICSA reports its accuracy for identifying symptoms of anxiety in individuals. Increasing the research of the STICSA with diverse samples will add to the existing body of knowledge about its measurement qualities. Initially, the STICSA was used to discriminate depression and anxiety when using psychological measures. Some disorders, like bipolar disorder, have symptoms that may be difficult to differentiate from anxiety and depression which is a limitation of STICSA. However, the General Behavior Inventory examined psychometric support to identify mood symptoms, especially differentiating unipolar and bipolar depression. This thesis used the STICSA and GBI to assist in assessing the construct validity of the TDI.

Balsamo et. al (2015) investigated the effectiveness of using the STICSA with an elderly

population. Previous research has shown that the STICSA has sound psychometric properties for measuring anxiety in adults. Balsamo et. al (2015) studied 396 community participants who were administered the STICSA, TDI, and the Geriatric Depression Scale (GDS; Yesavage et al., 1982) and the Health Survey (Ware, Kosinski, & Keller, 1996). Psychometric properties were investigated by assessing the internal consistency of the STICSA scales using Cronbach's alpha. Internal consistency was considered high with Cronbach's alpha coefficients of .86 for state-cognitive, .90 for state-somatic, .86 for trait-cognitive, and .87 for trait-somatic. Additionally, confirmatory factor analysis was used to test four different oblique models. Results indicated that model 4 (Four-factor model) had adequate to excellent fit across all indices. This was also true for model 2 (two-factors, cognitive-somatic) which also had an adequate fit.

Construct Validity of the TDI with a Black African American Sample.

Recent studies have examined the validity of the TDI is with diverse populations. Originally, the TDI was created in Italian but was translated into English to examine validity across different countries. Rushworth (2017) examined the construct validity of the English version of the TDI with a specific focus on validity for Black/African American young adults. The total sample consisted of 578 young adult participants who were also asked to complete the State-Trait Inventory Cognitive and Somatic Anxiety (STICSA; Ree et al., 2000) and the General Behavior Inventory (GBI; Depue, 1987) for comparisons with the TDI. However, only 285 participants completed both the TDI and the STICSA. The primary focus of the study was to examine if there were differences in construct validity estimates between Black/African Americans and White/Caucasians. Individuals who did not identify as Black/African Americans or White/Caucasians were eliminated from the study. The total sample used for data analysis included 24 Black/African Americans and 218 White/Caucasians. Invitations were sent to solicit

participants and interested participants followed the link to the Qualtrics platform to complete the TDI, STICSA, and GBI in a random counterbalanced order. The invitations were distributed through an anonymous electronic link that was provided to targeted institutions across the United States.

Rushworth (2017) used Pearson product-moment correlations reflecting convergent and discriminant validity of the TDI, STICSA, and GBI. It was hypothesized that scores from the TDI and GBI Depression subscale would produce a higher correlation (convergent validity) than the TDI and GBI Hypomanic/Biphasic subscale (discriminant validity). Likewise, Rushworth expected TDI scores and the STICSA Trait and State Cognitive (scales to produce higher correlations (convergent validity) than the TDI and the Trait and State STICSA scales (discriminant validity).

TDI and the GBI. Convergent validity is a subset of construct validity, where two measures purport to measure the same construct and produce high correlations. Strong convergent validity is demonstrated by coefficients of .70 or higher. Results indicated strong correlations between the TDI and the GBI. The TDI Total score had high correlations with the GBI Depressive scale r = .76 for the total sample (.82 for Black/African American participants and .76 for White/Caucasian participants) reflecting convergent validity. Convergent validity coefficients for the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF), subscales with the GBI Depressive scale ranged between .53 and .76 with shared variance ranging from 28% to 57% for the total sample.

For Black/African American participants, convergent validity coefficients for the TDI subscales (DM, LS, DF) with the GBI Depressive scale ranged from .69 to .84 and the percent of shared variance ranged from 48% to 71%. For White/Caucasian participants, convergent validity

coefficients for the TDI subscales (DM, LS, DF) with the GBI Depressive scale ranged from .53 to .76 and the percent of shared variance ranged from 28% to 58%.

TDI and the STICSA. Results indicated moderate to strong correlations between the TDI and the STICSA. The TDI Total score demonstrated convergent validity with the STICSA-Trait Cognitive scale (r = .66) for the total sample. Convergent validity coefficients for the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF), subscales with the STICSA-Trait Cognitive scale ranged between .50 and .85 with shared variance ranging from 25% to 72% for the total sample.

The TDI total score demonstrated convergent validity with the STICSA-Trait Cognitive scale (r = .84) for Black/African American participants. Convergent validity coefficients for the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF) subscales with the STICSA-Trait Cognitive scale ranged between .69 and .85 with shared variance ranging from 48% to 72% for the Black/African American participants. Likewise, the TDI Total score had convergent validity with the STICSA-Trait Cognitive scale (r = .66) for White/Caucasian participants. Convergent validity coefficients for the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF) subscales with the STICSA-Trait Cognitive scale ranged between .50 and .65 with a shared variance ranging from 25% to 42% for the White/Caucasian participants.

The TDI Total score demonstrated convergent validity with the STICSA-State Cognitive scale (r = .56) for the total sample. Convergent validity coefficients for the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF) subscales with the STICSA State Cognitive score ranged between .69 and .76 with shared variance ranging from 48% to 57% for the total sample.

The TDI Total score had convergent validity with the STICSA-State Cognitive scale (*r* = .76) for Black/African Americans participants. Convergent validity coefficients for the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF) subscales with the STICSA State Cognitive score ranged between .69 and .81 with shared variance ranging from 48% to 66% Black/African Americans participants. Likewise, the TDI Total score had convergent validity with the STICSA-State Cognitive scale (*r* =.65) for White/Caucasian participants. Convergent validity coefficients for the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF) subscales with STICSA State Cognitive scores ranged between .49 and .64 with shared variance ranging from 24% to 41% for White/Caucasian participants.

Discriminant Validity of the TDI

TDI and the GBI. When discriminant validity coefficients are lower than convergent validity coefficients and purport to measure different constructs, there is support for discriminant validity. To determine discriminant validity, results should reflect lower correlation coefficients than convergent validity because the scales measure different constructs that may be related but not identical. The discriminant validity coefficient for the TDI Total score and the GBI Hypomanic/Biphasic scale for the total sample was .45. Discriminant validity coefficients for the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF) subscales with the GBI Hypomanic/Biphasic scale ranged between .35 and .48 with shared variance ranging from 12% to 23% for the total sample.

For Black/African American participants, the discriminant validity coefficient for the TDI Total and the GBI Hypomanic/Biphasic scale was .67. Discriminant validity between the TDI subscales (DM, LS, DF) and the GBI Hypomanic/Biphasic scale ranged from .52 to .71 with

shared variance between 27% to 50% for Black African American participants. For White/Caucasian participants, the discriminant validity coefficient for the TDI Total score and the GBI Hypomanic/Biphasic scale was .45. Discriminant validity coefficients between the TDI subscales (DM, LS, DF) and the GBI Hypomanic/Biphasic ranged from .35 to .48 with shared variance between 12% to 48% for the White/Caucasian participants.

TDI and the STICSA. The TDI Total and the STICSA Trait Somatic scale had discriminant validity coefficient of .44 for the total sample. Discriminant validity coefficients the TDI Depressed Mood (DM), Life Satisfaction (LS), Daily Function (DF), and the STICSA-Trait Somatic ranged between .33 and .53 with shared variance ranging from 11% to 28% for the total sample.

For Black/African American participants, the TDI Total and the STICSA-Trait Somatic scale had a discriminant validity coefficient of .49. The TDI subscales (DM, LS, DF) and STICSA Trait Somatic score had discriminant validity coefficients for Black/African Americans between .33 and .53 with shared variance ranging from 11% and 28%. For White/Caucasians, the TDI Total and the STICSA Trait Somatic scale had a discriminant validity coefficient of .44. The discriminant validity coefficients between the TDI subscales (DM, LS, DF) and the STICSA-Trait Somatic ranged between .38 to .46 with shared variance ranging from 13% to 18% for White/Caucasian participants.

The TDI Total score and the STICSA State Somatic scale had a discriminant validity coefficient of .44 for the total sample. Discriminant validity coefficients the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF) subscales with STICSA-State Somatic ranged between .35 and .51 with shared variance ranging from 12% to 26% for the total sample.

For Black/African American participants, the TDI Total and the STICSA-State Somatic scale had a discriminant validity coefficient of .51. The TDI subscales (DM, LS, DF) and STICSA Trait Somatic score had discriminant validity coefficients between .35 and .51 with shared variance ranging from 11% and 28% for Black/African American participants. For White/Caucasians, the TDI Total and the STICSA-State Somatic scale had a discriminant validity coefficient of .44. The discriminant validity coefficients between the TDI subscales (DM, LS, DF) and the STICSA-State Somatic scale ranged between .38 to .46 with shared variance ranging from 13% to 21% for White/Caucasian participants.

Limitations of Rushworth (2017)

A limitation of the Rushworth (2017) study was the small sample size of African Americans participants (n = 24). Obtaining African Americans participants was a priority of the study to examine the construct validity of the TDI with a diverse sample. Because of the small of Black/African American sample, the study had low statistical power (between .10 and .45) that may have contributed to the inability to detect statistical differences between Black/African Americans and White/Caucasians. Replication and extension of this study with a larger sample of Black/African American participants would provide more power to successfully analyze if Black/African Americans obtain similar TDI convergent and discriminant validity coefficients as White/Caucasians.

Construct Validity of the TDI with an Middle Eastern/Arab American (ME/AA) Sample

Bunni (2019) examined the construct validity of the TDI with particular interest in Middle Eastern/Arab American (ME/AA) young adults. Like Rushworth, Bunni had participants complete the TDI, STICSA, and GBI to examine convergent and discriminant validity. However, Bunni (2019) conceptualized the TDI and the STICSA comparison differently than

Rushworth 2017 and examined all STICSA comparisons as discriminant. Her results demonstrated strong psychometric properties of the TDI with the total combined sample and with separate ME/AA and White/Caucasian samples. Bunni (2019) results also found that there were no significant differences among validity coefficients between Middle Eastern Americans and White/Caucasians on the TDI, thus, indicating that the TDI measured depression among ME/AA similar to their White/Caucasian peers.

Convergent Validity of the TDI

TDI and the GBI. Results indicated strong correlations between the TDI and the GBI. The TDI Total score had a strong convergent validity coefficient with the GBI Depressive scale of $r = .82$ for the total sample. Convergent validity coefficients of the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF) with the GBI Depressive scale ranged between .57 and .89 with shared variance ranging from 32% to 80% for the total sample.

For ME/AA participants the TDI Total score had strong convergent validity with the GBI Depressive scale with a correlation of .82 (.78 for White/Caucasian participants). For ME/AA participants, convergent validity coefficients for the TDI subscales (DM, LS, DF) with the GBI Depressive scale ranged from .37 to .86 with shared variance ranging from 13% to 74%. For White/Caucasian participants, convergent validity coefficients for the TDI subscales (DM, LS, DF) with the GBI Depressive scale ranged from .52 to .89 and shared variance ranging from 27% to 80%.

Discriminant Validity

TDI and the GBI. The discriminant validity coefficient for the TDI Total and the GBI Hypomanic/Biphasic scale produced a coefficient of .54 for the total sample. For the total sample, discriminant validity between the TDI subscales (DM, LS, DF) and the GBI

Hypomanic/Biphasic scale ranged from .30 to .66 with shared variance ranging between 1% to 44%.

For ME/AA participants, the discriminant validity coefficient for the TDI Total and the GBI Hypomanic/Biphasic scale was .60. Discriminant validity coefficients between the TDI subscales (DM, LS, DF) and the GBI Hypomanic/Biphasic scale ranged from .25 to .70 with shared variance ranging from 1% to 49% for ME/AA participants. For White/Caucasian participants, the discriminant validity coefficient for the TDI Total and the GBI Hypomanic/Biphasic scale was .45. Discriminant validity between the TDI subscales (DM, LS, DF) and the GBI Hypomanic/Biphasic scale ranged from .10 to .63 with shared variance ranging from 1% to 40% for White/Caucasian participants.

TDI and the STICSA. The TDI Total score and the STICSA Trait Somatic scale had a discriminant validity coefficient of .71 for the total sample. Discriminant validity coefficients between the TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF) subscales with the STICSA-Trait Somatic scale ranged between .51 and .74 with shared variance ranging from 26% to 55% for the total sample.

For ME/AA participants, the TDI Total score and the STICSA-Trait Somatic scale had a discriminant validity coefficient of .84. The TDI subscales (DM, LS, DF) and STICSA-Trait Somatic scale had discriminant validity coefficients for ME/AA participants ranging from .62 to .89 with shared variance ranging between 38% to 79%. Likewise, W/C participants had a discriminant validity coefficient for the TDI Total and the STICSA Trait Somatic scale of .62. For W/C participants, the TDI subscales (DM, LS, DF) and STICSA-Trait Somatic scale had discriminant validity coefficients ranging from .36 to .64 with share variance ranging between 13% to 41%.

The TDI Total score and the STICSA-Trait Cognitive scale had a discriminant validity coefficient of .71 for the total sample. The TDI subscales (DM, LS, DF) and STICSA-Trait Cognitive scale had discriminant validity coefficients for the total sample that ranged between .58 to .79 with shared variance ranging between 33% to 62%.

The discriminant validity coefficient of the TDI Total and STICSA-Trait Cognitive scale for ME/AA was .90. The TDI subscales (DM, LS, DF) and STICSA-Trait Cognitive scale scores had discriminant validity coefficients for the total sample ranged between .73 to .89 with shared variance ranging between 53% to 79% for ME/AA participants. Likewise, W/C participants had a discriminant validity coefficient for the TDI Total and the STICSA-Trait Cognitive of .68. The TDI subscales (DM, LS, DF) and STICSA-Trait Cognitive score had discriminant validity coefficients for W/C participants ranging from .41 to .71 shared variance ranging between 17% to 50%.

The TDI Total score and the STICSA-State Somatic scale had a discriminant validity coefficient of .36 for the total sample. Discriminant validity coefficients for the TDI Depressed Mood (DM), Life Satisfaction (LS), Daily Function (DF) and the STICSA-Trait Somatic scale ranged between .36 and .64 with shared variance ranging from 13% to 41% for the total sample.

For ME/AA participants, the TDI Total score and the STICSA-State Somatic scale had a discriminant validity coefficient of .53. For W/C participants, the TDI Total score and the STICSA State Somatic scale had discriminant validity coefficient of .53. The TDI subscales (DM, LS, and DF) and STICSA-State Somatic scores had discriminant validity coefficients for W/C participants ranging from .51 to .73.

Limitation of Bunni (2019)

A similar limitation of the Bunni (2019) study was the small sample size of ME/AA participants in her study (n = 17). The small sample size resulted in low statistical power that made it difficult to analyze statistical differences between groups. Also, the STICSA coefficients for Middle Eastern/Arab Americans were high and did not demonstrate discriminant validity. Further research should continue to examine the TDI across different ethnicities. As previously stated, there is limited research on culturally responsive measures of mental health and replications of research on the TDI may help clinicians find an appropriate instrument to assess depression in diverse populations.

Summary

To guarantee all individuals are accurately diagnosed, it is essential to use measures that have demonstrated strong psychometric properties for identification. Research has shown limitations in identifying symptoms in individuals of diverse ethnic backgrounds and furthering the discrepancies between identification, diagnosis, and treatment of mental health disorders with diverse populations. The GBI has shown success in identifying specific mood disorders in individuals. Additionally, it can differentiate symptoms of depression and hypomania/biphasic in individuals making it more successful in obtaining an accurate diagnosis. The GBI has also been shown to be effective with ethnic minorities, children, adolescents, and adults (Lee et al., 2015).

The STICSA was developed to better assess anxiety and to distinguish between somatic and cognitive symptoms in individuals. The STICSA has been effective in differentiating anxiety symptoms and is useful in prescribing appropriate treatment (Ree et al., 2008). Although relatively new, the TDI was developed and found to be a more appropriate instrument in

measuring depression. The TDI has also been able to distinguish between different levels of depression, allowing clinicians to make more accurate diagnosis (Balsamo & Saggino, 2014).

Little research has shown its effectiveness with diverse populations. Rushworth (2017) found that the TDI might identify depression in Black/African Americans similarly as their White/Caucasian peers. However, both studies had small samples and low statistical power, making it difficult to identify statistically analyze significant differences between groups. Like Bunni (2019), the present thesis will focus on analyses with only the TDI Total and not TDI subscales. When Ruan (2016) adapted the TDI to English, exploratory factor analysis was conducted, and 4 factor loadings (subscales) were found of the TDI. There has been no replication of the Ruan (2016) study, and more research needs to be conducted to determine the subscales overall validity. Rushworth (2017) predicted discriminant validity between the TDI-Total and the STICSA Cognitive scales. The present thesis predicted discriminant validity for the STICSA Cognitive scales like Bunni (2019). Replicating the construct validity of the TDI with a Black/African sample with a larger sample size will achieve good statistical power to successfully test the hypotheses.

Research Questions

The purpose of the present research was to replicate and extend the construct validity of the TDI by continuing to answer the following questions: 1) Does the TDI present appropriate construct validity? 2) Does the TDI have evidence of convergent and discriminant validity compared to the General Behavior Inventory (GBI; Depue, 1987) and State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, MacLeod, French, & Locke, 2000): convergent validity coefficients for the TDI and GBI Depression scales showing higher correlations, while discriminant validity coefficients for the TDI, STICSA and the GBI Hypomanic/Biphasic scales

showing lower correlations? 3) Is there equivalent convergent coefficients between the TDI and the GBI depression scale for White/Caucasians and Black/African Americans? 4) Is there similar c discriminant validity coefficients between the TDI and the STICSA cognitive scale for White/Caucasian and Black/African Americans? The present thesis examined convergent and discriminant validity coefficients between the TDI and the GBI depression scale for Black/African Americans and White/Caucasians. Additionally, the present thesis compared similarities of discriminant validity coefficients between the TDI and the STICSA Cognitive scale for Black/African Americans and White/Caucasians. Data collected from the present thesis was combined with Rushworth (2016) to provide more stable estimates for convergent and discriminant validity.

Methods

Participants

This study targeted participants who identified as Black/African American and White/Caucasian for a comparative analysis. Individuals who did not identify as Black/African American and White/Caucasian were encouraged to participate but were not used in data analysis in the present study. To produce stable estimates for convergent and discriminant validity, data was combined with Rushworth (2017). This thesis included adults of any age, but analysis focused on ages 18 to 30 consistent with Rushworth (2017). Anyone under the age of 18 was removed from the study.

The total sample included all those who fully completed the TDI, the STICSA, and the GBI which included 271 participants. Of the 271, 226 identified as White/Caucasian and 45 identified as Black/African American. The majority of the total sample reported they were female. The average age of the total sample was 23 years (*SD* = 5.67). For the Black/African

American group the average age was 25 years (*SD* = 8.23) and for the White/Caucasian group the average age was 23 years (*SD* = 4.98). Demographic information for the total sample (*n* = 271), as well the Black/African American participants (*n* = 45) and White/Caucasian participants (*n* = 226) are provided in Table 1.

Table 1
Sample Demographic and Characteristic for the Total Sample and Separate African American and White Caucasian Groups

	Total Sample (*n* = 271)		Black/African American (*n* = 45)		White/ Caucasian (*n* = 226)	
Variable	*n*	%	*n*	%	*n*	%
Gender						
Male	45	16.6	12	26.7	33	14.6
Female	210	77.5	31	68.9	179	79.2
Other	16	5.9	2	4.4	14	6.2
Sexual Orientation						
Homosexual	15	5.2	3	6.7	11	4.9
Heterosexual	182	67.2	37	82.2	145	64.2
Bisexual	53	19.6	3	6.7	50	22.1
Other	22	8.1	2	4.4	20	8.8
Race/Ethnicity						
White/Caucasian	226	83.4				
Black/African Americans	45	16.6				
Self-Reported Diagnosis						
Depression	21	7.7	5	11.1	16	7.1
Anxiety	64	23.6	5	11.1	22	9.7
Depression and Anxiety	21	7.7	9	20.0	55	24.3
Bipolar Disorder	4	1.5	0	0	4	1.8
Other/Multiple	39	14.4	2	4.4	92	34.3
None	105	38.7	24	53.3	81	35.8

Instruments

Teate Depression Inventory. The TDI (Balsamo & Saggino, 2013) is a self-report measure of depression symptoms, containing 21 items rated on a 5-point ordinal scale (0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = always). As previously reviewed, the TDI produced strong reliability and validity estimates with Italian participants. Data analyses included the following scores: TDI Total (sum of all 21 items), Depressed Mood (DM), Life Satisfaction (LS), and Daily Function (DF). Exploratory factor analysis was used to create subscale scores for the TDI (Ruan et al., 2016). The English translated version of the TDI (Ruan et al., 2016) was used with publisher permission for the purposes of the present thesis

General Behavior Inventory. The GBI (Depue, 1987) is a self-report measure of mood disorder symptoms. It contains 73 items rated on a 4-point ordinal scale (0 = Never or Hardly Ever, 1 = Sometimes, 2 Often, 3 = Very Often Almost Constantly). Participant's responses indicate how often they experience depressive (46 items) and hypomanic/biphasic symptoms (28 items). One item is included to express symptoms on both scales.

State-Trait Inventory for Cognitive and Somatic Anxiety. The STICSA (Ree et al., 2000) is a self-report scale that measures symptoms of cognitive and somatic anxiety at a specific time (state) or in general (trait). The Trait scale contains 21 items (10 cognitive symptoms and 11 somatic symptoms) rated on a 4-point ordinal scale (1 = almost never, 2 = occasionally, 3 = often, 4 = almost always) to estimate frequency of anxiety symptoms. The State scale also contains 21 items (10 cognitive and 11 somatic) rated on a 4-point ordinal scale (1 = not at all, 2 = a little, 3 = moderately, 4 = very much so) to measure the intensity of anxiety symptoms.

Procedure

Eastern Illinois University Institutional Review Board (IRB number 19-042) approved this research and agreed that the study was of minimal risk to participants. The study was administered anonymously and electronically using Qualtrics. Prospective participants received an invitation letter with a URL link to the research questionnaires using Qualtrics. Additionally, the link was shared with student organizations at Eastern Illinois University, as well as professors at other colleges and universities across the United States, mentorship programs, and online mental health support groups. The Qualtrics survey of Rushworth (2017) was used for consistent data collection.

Demographic information was collected including age, gender/sex, race/ethnicity, religious affiliation, marital status, sexual orientation, self-report of formal diagnosis, zip code, and education level. Participants were asked to specify their race/ethnicity and gender/sex if an option was not listed. Next, each participant was asked to provide consent to participate in the study prior to responding to the TDI, GBI, STICSA scales. After completion, participants provided their email if interested in consideration for a chance to win a $50 Amazon gift that was randomly drawn.

Data Analyses

Pearson product-moment correlations using SPSS Version 24 provided convergent and discriminant validity coefficients for the TDI, STICSA, and GBI scores. To compare convergent and discriminant validity coefficients, *z*-tests for dependent correlations were calculated for the total sample as well as the Black/African American and White/Caucasian groups using the *SimpleStats Test* program (Watkins, 2007). Also, *t*-tests for independent correlations were calculated using *SimpleStats Test* program (Watkins, 2007) to determine significant differences

between convergent and discriminant validity coefficients produced by Black/African American and White/Caucasian groups. These analyses were used to answer research questions to determine construct validity of the TDI.

Results

Descriptive Statistics

Means, standard deviations, skewness, and kurtosis estimates for the TDI, STICSA, and GBI for the total sample are presented in Table 2. The TDI Total had a mean of 46.07 for the total sample. The TDI Depressed Mood, Life Satisfaction and Daily Functioning subscales had means ranging from 6.73 to 25.09. The STICSA Trait Cognitive, Trait Somatic, State Cognitive, and State Somatic scale had means ranging from 16.41 to 24.76. The GBI Depression and Hypomanic/Biphasic scales had means of 29.58 and 64.83, respectively. Skewness and kurtosis estimates for the TDI, STICSA, and GBI indicated that

Table 2

D*escriptive Statistics for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory for the Total Sample (N = 271)*

			Range			
Variable	*M*	*SD*	Potential	Actual	Skewness	Kurtosis
Teate Depression Inventory						
Total	46.07	17.41	0-88	6-79	-0.27	-0.81
Depressive Mood	25.09	10.25	0-44	3-43	0.01	-0.42
Life Satisfaction	14.25	7.40	0-28	0-25	0.51	-0.24
Daily Functioning	6.73	2.52	0-12	1-12	0.23	-0.06
State-Trait Inventory for Cognitive and Somatic Anxiety						
Trait-Cognitive	24.76	7.22	10-40	10-40	-0.11	-0.82
Trait-Somatic	19.60	5.50	11-41	11-41	0.67	0.16
State-Cognitive	21.64	8.44	10-40	10-40	0.30	-1.02
State-Somatic	16.41	5.52	11-41	11-37	1.30	1.73
General Behavior Inventory						
Depression	64.82	34.33	0-138	2-112	0.30	-0.48
Hypomania/Biphasic	29.58	19.00	0-84	0-62	0.60	-0.31

Convergent Validity

TDI and GBI. Table 3 presents convergent and discriminant validity coefficients for the total sample. The full correlation matrix for all TDI, STICSA, and GBI scales are presented in Table A1 in the Appendix. The convergent validity coefficient for the TDI Total score with GBI Depression score was .78 with 60.8% of shared variance. The TDI Depressed Mood (DM), Life Satisfaction (LS), and Daily Functioning (DF) subscale scores correlations with the GBI Depression score ranged from .49 to .86. Their shared variance ranged from 19.3% to 73.9%.

Convergent and discriminant validity coefficients for the Black/African American group and the White/Caucasian group are presented in Table 4. The convergent validity coefficient between the TDI Total and the GBI Depression scale for the Black/African American participants was .72 with 51.8% of shared variance. The TDI DM, LS, DF subscale scores

correlations with the GBI Depression score ranged from .32 to .85. The percent of shared variance ranged from 10.2% to 72.3 %. For the White/Caucasian participants, the convergent validity coefficient between the TDI Total score and the GBI Depression score was .80 with 64% shared variance. The TDI DM, LS, DF subscale scores correlations with the GBI Depression score ranged from .45 to .82. The percent of shared variance ranged from 20.3% to 67.2%.

Table 3
Construct Validity Coefficients for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory for the Total Sample (N = 271)

	Teate Depression Inventory			
	Total	DM	LS	DF
State-Trait Inventory for Cognitive and Somatic Anxiety				
Trait Cognitive	.44	.59	.16	.15
Trait Somatic	.29	.42	.06	.11
State Cognitive	.48	.61	.21	.20
State Somatic	.31	.39	.13	.19
General Behavior Inventory				
Depression	.78	.83	.53	.44
Hypomania/Biphasic	.64	.64	.48	.42

Note. TDI = Teate Depression Inventory, STICSA = State Trait Inventory for Cognitive and Somatic Anxiety, GBI = General Behavior Inventory, DM = Depressed Mood, LS = Life Satisfaction, DF = Daily Functioning, TC = Trait Cognitive, TS = Trait Somatic, SC = State Cognitive, SS = State Somatic, D = Depression, H/B = Hypomania/Biphasic. Light grey shading highlights the convergent validity coefficients. Dark grey shading highlights the discriminant validity coefficients.
*$p < .05$, **$p < .01$

Discriminant Validity.

TDI and GBI. The TDI and GBI correlation coefficients for the total sample are presented in Table 3. Discriminant validity was found between the TDI Total score and the GBI Hypomanic/Biphasic score with a correlation coefficient of .64, which was lower than the TDI-Total GBI-Depression correlation. The percent of shared variance was 40.9%.

Discriminant validity coefficients for the Black/African American and White/Caucasian groups are presented in Table 4. For the Black/African American participants, discriminant validity was found between the TDI Total and the GBI Hypomanic/Biphasic score with correlation coefficient of .66, which was lower than the TDI Total-GBI Depression correlation. The percent of shared variance was 43.6%. For the White/Caucasian participants, discriminant validity was found between the TDI Total score the GBI Hypomanic/Biphasic scores with a correlation coefficient of .62, which was lower than the TDI Total-GBI Depression correlation. The percent of shared variance was 38.4.

TDI and STICSA. Discriminant validity correlation coefficients between the TDI and STICSA for the total sample are presented in Table 3. For the total sample, discriminant validity was found between TDI Total score and the STICSA Trait Cognitive score with a correlation of .44 and 19.4% shared variance. Discriminant validity was found between the TDI Total score and the STICSA State Cognitive score with a correlation coefficient of .48 and 38.7% shared variance. Discriminant validity was found between the TDI Total score and the STICSA Trait Somatic score with correlation of .29 and 8.4% share variance. Discriminant validity was found between the TDI Total score and the STICSA State Somatic score with a correlation coefficient of .31 and 15.2% shared variance. All four discriminant validity correlations were lower than the TDI-Total GBI-Depression convergent validity coefficient (r = .78).

Discriminant validity coefficients between the TDI and the STICSA for Black/African American participants are presented Table 4. The discriminant validity coefficient for the TDI Total score and the STICSA Trait Cognitive was .41 with 16.8% shared variance. Discriminant validity was found between the TDI Total score and the STICSA State Cognitive with correlation of .40 and 16% shared variance. Discriminant validity was found between the TDI

Total score and the STICSA Trait Somatic score with a coefficient of .23 and 5.3% shared variance. Discriminant validity was found between the TDI Total score and the STICSA State Somatic score with a correlation coefficient of .25 and 6.3% shared variance. All four discriminant validity coefficients were lower than the TDI Total-GBI Depression convergent validity coefficient (r = .72).

Table 4

Construct Validity coefficients for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory for Black/African American and White/Caucasian Groups

	Teate Depression Inventory			
	Total	DM	LS	DF
Black African American (n = 45)				
State-Trait Inventory for Cognitive and Somatic Anxiety				
Trait Cognitive	.41**	.73**	-.06**	-.02
Trait Somatic	.23	.49**	-.12	-.09
State Cognitive	.40**	.70**	-.05	.02
State Somatic	.25	.50**	-.12	-.01
General Behavior Inventory				
Depression	.72**	.85**	.32*	.36*
Hypomania/Biphasic	.66**	.71**	.36*	.40**
White/Caucasian (n =226)				
State-Trait Inventory for Cognitive and Somatic Anxiety				
Trait Cognitive	.53**	.59**	.34	.30**
Trait Somatic	.36**	.42**	.18**	.23**
State Cognitive	.56**	.61**	.37**	.31**
State Somatic	.35**	.37	.26	.28
General Behavior Inventory				
Depression	.80**	.82**	.60**	.45**
Hypomania/Biphasic	.62**	.62**	.47**	.38**

Note. TDI = Teate Depression Inventory, STICSA = State Trait Inventory for Cognitive and Somatic Anxiety, GBI = General Behavior Inventory, DM = Depressed Mood, LS = Life Satisfaction, DF = Daily Functioning, TC = Trait Cognitive, TS = Trait Somatic, SC = State Cognitive, SS = State Somatic, D = Depression, H/B = Hypomania/Biphasic. Light grey shading highlights convergent validity coefficients. Dark grey shading highlights the discriminant validity coefficients.

*p < .05, **p< .01

The discriminant validity coefficients between the TDI and the STICSA for the White/Caucasian group are presented in Table 4. The discriminant validity coefficient for the TDI Total score and the STICSA Trait Cognitive score was .53 with 28.1% shared variance. The discriminant validity coefficient between the TDI Total score and the STICSA State Cognitive score was .56 with 31.4% shared variance. The discriminant validity coefficient between the TDI Total score and the STICSA Trait Somatic score was 36 with 13% shared variance. Discriminant validity coefficient between the TDI Total score and the STICSA State Somatic score was .35 and 12.3% shared variance. All four discriminant validity coefficients were lower than the TDI Total-GBI Depression coefficient (r = .72).

Statistical tests were conducted to determine if convergent validity coefficients were significantly higher than discriminant validity coefficients. Dependent *t*– tests for differences between correlations were calculated using *SimpleStats Test* (Watkins, 2007) to compare the TDI Total-GBI Depression correlation to the TDI Total-STICSA Trait Cognitive, TDI Total-STICSA Trait Somatic, TDI Total-State Cognitive, and TDI Total-STICSA State Somatic correlations and are presented in Table 5. All comparisons indicated that the TDI Total and GBI-Depression correlation was significantly higher than all four TDI Total-STICSA scales correlations. The TDI-Total and GBI-Depression correlation was also significantly higher than the GBI Hypomanic/Biphasic scale.

Table 5
Comparison of the Teate Depression Inventory Total and the General Behavior Inventory Depression Convergent Validity Coefficient to the State-Trait Inventory for Cognitive and Somatic Anxiety Scales Discriminant Validity Coefficients for the Total Sample

Comparison		*t*	*df*	*p*
TDI Total – GBI Depression vs. TDI Total – STICSA Trait Cognitive	*r* = .78 *r* = .44	3.73	268	.0002
TDI Total – GBI Depression vs. TDI Total – STICSA Trait Somatic	*r* = .78 *r* = .29	3.50	268	.0005
TDI Total – GBI Depression vs. TDI Total – STICSA State Cognitive	*r* = .78 *r* = .48	3.82	268	.0002
TDI Total – GBI Depression vs. TDI Total – STICSA State Somatic	*r* = .78 *r* = .31	3.52	268	.0005
TDI Total – GBI Depression vs. TDI Total – GBI Hypomanic/Biphasic	*r* = .78 *r* = .63	6.45	268	.0001

Note. TDI = Teate Depression Inventory, STICSA = State Trait Inventory for Cognitive and Somatic Anxiety, GBI = General Behavior Inventory,

Between Group Comparisons

Independent *z*-tests for differences between correlations were conducted to compare convergent and discriminant validity coefficients between the Black/African American and White/Caucasian groups using *SimpleStats Test* (Watkins, 2007) and results are presented in Table 6. Results indicated no statistically significant differences in convergent validity coefficients (TDI-Total and GBI-Depression) or discriminant validity coefficients (TDI-Total and STICSA scales, TDI-Total and GBI-Hypomanic Biphasic scale) between Black/African American and White/Caucasian participants. Thus, convergent validity and discriminant validity coefficients for Black/African Americans and White/Caucasian group were equivalent.

Table 6
Between Group Comparisons of Construct Validity Coefficients for Teate Depression Inventory, State - Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory.

	Race/Ethnicity			
Validity Coefficient	B/AA	W/C	*z*	*p*
Convergent				
TDI Total and GBI Depression	.72	.80	-1.14	.2562
Discriminant				
TDI Total and STICSA Trait Cognitive	.41	.53	-0.92	.3582
TDI Total and STICSA State Cognitive	.40	.56	-1.26	.2091
TDI Total and STICSA Trait Somatic	.23	.36	-1.24	.2136
TDI Total and STICSA State Somatic	.25	.35	-0.65	.5130
TDI Total and GBI Hypomanic/Biphasic	.66	.62	0.40	.6869

Exploratory and initial comparisons between mean differences for Black/African Americans and White Caucasians were analyzed. Mean TDI, STICSA, and GBI score differences between Black/African American and White/Caucasian groups were examined using independent *t*-tests for differences between means and results are presented in Table 7. Results indicated that the TDI Total for Black/African American participants was significantly higher than for White/Caucasian participants with a moderate effect size of .63. The STICSA Trait Cognitive score for Black/African American participants was significantly lower than for White/Caucasian participants with a small effect size of .44. Lastly, the GBI Hypomanic/Biphasic score for Black/African American participants was significantly higher than for White/Caucasian participants with a moderate effect size of .61. No other scores showed significant differences between Black/African Americans and White Caucasians groups ($p>.05$)

Table 7
Descriptive Statistics, T, and Effect Size Estimates for Differences Between Black/African American and White/Caucasian Groups

	B/AA		W/C				
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*
Teate Depression Inventory							
Total	55.55	19.35	44.21	16.41	4.05	0.001	0.63
State Trait Inventory for Cognitive and Somatic Anxiety							
Trait Cognitive	21.91	8.56	25.32	6.80	-2.94	0.004	0.44
Trait Somatic	18.24	6.31	19.87	5.30	-1.82	0.070	0.28
State Somatic	16.02	6.25	16.49	5.37	-0.52	0.600	0.08
State Cognitive	19.84	10.34	22.00	7.99	-1.57	0.120	0.23
General Behavior Inventory							
Depression	73.13	38.41	63.17	33.02	1.79	0.080	0.28
Hypomanic/Biphasic	39.38	20.44	27.63	18.12	3.87	0.001	0.61

Note. B/AA = Black African American (n = 45); W/C = White/Caucasian (n = 226)

Discussion

The TDI (Balsamo & Saggino, 2014) is Rasch based self-report depression scale created to be a more reliable and valid measure of depression. Past research has noted the adequate diagnostic utility of the TDI in diagnosing Italian participants with different levels of depression, such as non-depressed, mild, moderate, and severely depressed (Balsamo & Saggino, 2014). Balsamo et al. (2015) used the TDI to examine the construct validity of the Other as Shame scale (OAS; Gross et al., 1994). Results from this study indicated that the TDI and the BDI-II correlated significantly with the OAS (r_{TDI} = .44, r_{BDI} = .41, p < .01), emptiness (r_{TDI} = .48, r_{BDI} = .41, p < .01), and mistake (r_{TDI} = .30, r_{BDI} = .32, p < .01) demonstrating convergent validity. Additionally, past research has yielded evidence of discriminate validity when comparing assessments that measure other constructs such as anxiety. Carlucci et al. (2018) found evidence

of discriminant validity between the STICSA scales and the TDI with correlations between the TDI and the STICSA that ranged from .30 to .42.

The TDI was translated into English for use in the U.S. (Ruan et al., 2016) and research was conducted with different ethnic groups. Two studies examined the construct validity of the TDI and the STICSA with ethnic minorities (Rushworth, 2017; Bunni, 2019). The present thesis examined convergent and discriminant validity of the Teate Depression Inventory (TDI; Balsamo & Saggino, 2014) with comparisons to the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, MacLeod, French, & Locke, 2008) and the General Behavior Inventory (GBI; Depue, 1987). The present thesis was an extension of Rushworth (2017) to better examine validity of the TDI and determine equivalence of validity coefficients for Black/African Americans and White/Caucasians. The present thesis resulted in higher power analysis (.99) than Rushworth 2017, which had low power between .10 and .45. Rushworth (2017) had a smaller sample of African American participants, resulting in low statistical power.

Previous research has highlighted the need for reliable and valid measures that can be used with ethnic minorities (Brookins et al., 1997; Hammock et. al., 2004). Research has found that African Americans have an increased risk for mental illnesses and underutilization of treatment (Wade & Bernstein, 1991; Gonzalez et. al., 2012). Research had found that 75% of Black/African American children have unmet needs regarding mental illnesses and they are unlikely to see mental health professionals after a major depressive episode (Kataoka et al. 2002; Cummins & Druss, 2011). Negative views on mental health services also affect African Americans from seeking out treatment. Multiple studies have found that African Americans have greater reservations about seeking out treatment than other ethnicities (Turner et al., 2015; Garland et. al, 2005). When African Americans do seek out treatment, they are more likely to be

misdiagnosed, leading to ineffective practices. Psychometrically sound and appropriate tools must be used when assessing mental health in African Americans. Accurate diagnoses could create more trust between this community and mental health practitioners.

Convergent Validity of the TDI

To determine the overall convergent validity of the TDI, the present thesis predicated that the TDI-Total and GBI-Depression scores would have high correlations coefficients with the total sample. The results from the present thesis found a high correlation coefficient between the TDI-Total and GBI-Depression (r = .78), supporting strong convergent validity. Bunni (2019) also examined the construct validity of the TDI with Middle Eastern/Arab American and White/Caucasian participants and also found a high correlation between the TDI-Total and the GBI-Depression scale (r = .82) indicating strong convergent validity for the total sample. Thus, the TDI appeals to measure depression symptoms similarity to the GBI.

Discriminant Validity of the TDI

Discriminant validity was predicted by lower correlations between the TDI Total and STICSA scales for the total sample. Results from the present thesis yielded significantly lower correlation coefficients between the TDI Total and the STICSA scales (Trait Cognitive r = .44, Trait Somatic r = .28, State Cognitive r = .48, State Somatic r = .31). Bunni (2019) found somewhat lower correlation coefficients between the TDI scale and STICSA scales for her total sample (Trait Cognitive r = .78, Trait Somatic r = .71, State Cognitive r = .76, State Somatic r = .43). Discriminant validity coefficients from the present thesis found lower correlations between the TDI-Total and STICSA scales than Bunni (2019). Discriminant validity was also noted in a study conducted by Carlucci et al. (2018) which found similarly lower correlations between the STICSA Trait Somatic and the TDI (r = .42), and between the STICSA State Somatic and the

TDI (r = .35). Thus, the TDI measures a different construct (depression) than the STICSA (anxiety).

The present thesis also predicted that the TDI-Total would demonstrate discriminant validity with lower correlation coefficients between the TDI-Total and the GBI Hypomanic/Biphasic scale. Results from the present thesis found a significantly lower correlation coefficient between the TDI-Total scale and GBI-Hypomanic/Biphasic scale (r = .64) for the total sample. Bunni (2019) also found discriminant validity with the TDI-Total scale and GBI-Hypomanic/Biphasic scale (r = .57) for her total sample. Thus, the TDI measured different constructs than the GBI-Hypomanic Biphasic scale.

Following Rushworth (2017), it was predicted that the TDI would demonstrate equivalent convergent validity with the TDI-Total and the GBI-Depression scale for both Black/African American and White/Caucasian groups. Results from the present thesis yielded high and statistically significant correlation coefficients between the TDI-Total and the GBI-Depression scale for Black/African American group (r = .72) and the White/Caucasian group (r = .80). There was no significant difference between the convergent validity coefficients between Black/African Americans and White/Caucasian groups showing equivalent convergent validity. Bunni (2019) also found statistically significant convergent validity coefficients of the TDI with Middle Eastern/Arab Americans (r = .84) and White/Caucasians (r = .81). There was no significant difference between the convergent validity coefficients for the Middle Eastern/Arab American and White/Caucasian groups showing equivalent convergent validity of the TDI.

Discriminant validity, as evidenced by lower correlations between the TDI-Total and the four STICAS scores, was expected for both Black/African American and White/Caucasian groups. Results from the present thesis found discriminant validity coefficients between the TDI-

Total and the four STICSA scales were significantly lower than the TDI-Total and GBI Depression convergent validity coefficients for Black/African Americans (*r's* ranged from .23 - .41) and White/Caucasians (*rs* ranged from .36 - .56). Discriminant validity coefficients did not significantly differ between Black/African Americans and White/Caucasians showing equivalent discriminant validity. The present thesis found stronger evidence for discriminant validity between the TDI-Total and the STICSA scales for ethnic minorities when compared to other studies. Bunni (2019) found a statistically significant discriminant validity coefficient between the TDI-Total and the STICSA State Somatic scale for Middle Eastern/Arab Americans ($r = .69$). Except for the State Somatic scale, discriminant validity was not supported between the TDI-Total and STICSA scales for Middle Eastern/Arab Americans between the TDI Total and STICSA scales. However, discriminant validity was supported between the TDI-Total and all STICSA scales with coefficients ranging from .34 - .68 for the White/Caucasians. There were no significant differences between the discriminant validity coefficients between Middle Eastern/Arab Americans and White/Caucasian groups suggesting equivalent validity.

Discriminant validity was also predicted to have lower correlations between the TDI-Total and the GBI-Hypomanic/Biphasic scale than the TDI-Total and GBI-Depression scale for both Black/African Americans and White/Caucasians. Results from the present thesis found significantly lower discriminant validity coefficients between the TDI-Total and the GBI-Hypomanic/Biphasic scale for Black/African American ($r = .66$) and White/Caucasians ($r = .62$), than convergent validity coefficients of the TDI-Total and GBI-Depression, indicating discriminant validity. Discriminant validity coefficients did not significantly differ between Black/African Americans and White/Caucasians showing equivalent discriminant validity. Bunni (2019) found lower discriminant validity coefficients between the TDI Total and the GBI-

Hypomanic/Biphasic scale for Middle Eastern/Arab Americans (r =.60) and White/Caucasians (r =.54). There were no significant differences between the discriminant validity coefficients of the TDI Total and GBI-Hypomanic/Biphasic scale for Middle Eastern/Arab Americans and White/Caucasian groups showing equivalent discriminant validity.

TDI Group Differences

In the present thesis Black/African Americans had a significantly higher TDI-Total mean than White/Caucasians with a moderate effect size of .63. Black/African Americans also had significantly higher mean GBI Hypomanic/Biphasic score than White/Caucasians with a moderate effect size of .61. Rushworth (2017) attempted to examine these differences; however, the small sample size made this difficult to compare statistically. Previous research has highlighted possible explanations for why these differences may exist, such as increased risk for mental illnesses, disparity in mental health treatment, cultural stigma, and overall distrust in the healthcare system (Gonzalez et al, 2010; Cooper et al., 2003; Wade & Bernstein, 1991). Such differences should be further examined to determine if they are sample specific.

To claim a test can be used with different subgroups in a population (i.e., African Americans) it is important to conduct the necessary research to determine appropriate test interpretations for their intended use for individuals from those subgroups (American Educational Research Association [AERA], 2014). Previous research has found that the TDI demonstrated convergent and discriminant validity with Italian participants who had different levels of depression (Balsamo & Saggino, 2014). Results from the present thesis demonstrated preliminary evidence for equivalent convergent validity of the English translated version of the TDI with Black/African Americans with the TDI's ability to measure depression similarly to White/Caucasian participants. Bunni (2019) found preliminary evidence for convergent validity

but not discriminant validity with the STICSA. Both studies found that the TDI measured depression similarly to White/Caucasians providing support noted by The Standards for Educational and Psychological Testing (AERA, 2014) for the evidence of equivalent psychometric support in various subgroups in a population.

Limitations

A major focus of the present thesis was examining the construct validity of the TDI with a Black/African American sample; therefore, it was critical to have an adequate sample of Black/African American participants. The sample size was disproportionate relative to race. Unfortunately, there were many fewer Black/African Americans who participated in the study compared to White/Caucasians. Previous research has suggested that Black/African Americans do not like to report mental health symptoms. Also, they are less likely to trust mental health professionals and experience a stigma for mental illness. These factors may have negatively influenced the participation of this group. Additionally, the small sample size, especially with Black/African Americans, limits the ability of the present thesis to be generalized.

Due to the pandemic occurring at time of the current thesis, obtaining additional data to add to Rushworth (2017) presented unique challenges that potentially impacted participation. Initially, data collection involved community events, which resulted in fully completed survey submission. Future research should continue to attend similar events to recruit willing participants. Another limitation of this study is that people may exaggerate and inaccurately report symptoms on self-report measures. Measures of depression and anxiety are self-reports. Therefore, the research was entirely anonymous so there was no way to determine a reporter's accuracy. Self-report measures can be subjected to personal biases and lead to inflated self-perception. Thus, the integrity of the participants responses is unknown.

Future Direction

To address previous limitations, continuing this research with a larger sample of Black/African Americans would provide better examination of the validity of the TDI with this population. Also, a larger sample size would provide greater statistical power to test the hypothesis regarding TDI construct validity with Black/African Americans and White/Caucasian. Future directions should focus on analyzing the construct validity of the TDI with different ethnic minorities and underrepresented groups (i.e. LGBTQ+ community, Native Americans, Hispanic, low socioeconomic status, etc). Like Black/African Americans, other groups (i.e. LGBTQ+ community, Native Americans, Hispanic, low socioeconomic status, etc) might be at risk for misdiagnosis and or mistrust the mental health care system. Therefore, conducting research that could provide insight into symptom presentation for other groups could lead to effective treatment.

Convergent and discriminant validity are two methods to assess construct validity. Other studies could explore the TDI's factor structure and factorial invariance between the two groups. This would require a large sample size to analyze variance and if items similarly loaded on factors for both groups. After finding support for construct validity, further research should examine the TDI's diagnostic utility with ethnic minorities. Future data collection will provide essential information to determine the TDI's overall ability to diagnosis depression in ethnic minorities and inform treatment.

Conclusion

The present thesis found further evidence for the convergent and discriminant validity of the TDI. Convergent validity was supported by the TDI and the GBI-Depression scale. Discriminant validity was found between the TDI and the STICSA scales as well was the GBI-Hypomanic/Biphasic scale. The larger sample size of Black/African Americans allowed for comparisons that previous research could not adequately conduct. Additionally, the present thesis found evidence for equivalence of construct validity between different ethnic groups, demonstrating the TDI had strong psychometric properties. In summary, providing psychometric evidence of the validity of TDI for measuring depression and anxiety among ethnic minorities may improve identification of mental health disorders and quality of treatment.

References

Alegría, M., Chatterji, P., Wells, K., Cao, Z., Chen, C., Takeuchi, D., Jackson, J., & Meng, X.-L. (2008). Disparity in depression treatment among racial and ethnic minority populations in the United States. *Psychiatric Services*, *59*(11), 1264–1272. https://doi.org/10.1176/ps.2008.59.11.1264

Anderson, E. R., & Mayes, L. C. (2010). Race/ethnicity and internalizing disorders in youth: A review. *Clinical Psychology Review, 30*(3), 338–348. https://doi.org/10.1016/j.cpr.2009.12.008

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV-TR.* American Psychiatric Association.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental disorders* (5th ed.). American Psychiatric Association.

Armstrong, K., Putt, M., Halbert, C. H., Grande, D., Schwartz, J. S., Liao, K., Marcus, N., Demeter, M. B., & Shea, J. A. (2013). Prior experiences of racial discrimination and racial differences in health care system distrust. *Medical Care*, *51*(2), 144–150. https://doi.org/10.1097/mlr.0b013e31827310a1

Balsamo, M., Romanelli, R., Innamorati, M., Ciccarese, G., Carlucci, L., & Saggino, A. (2013). The State-Trait Anxiety Inventory: shadows and lights on its construct validity. *Journal of Psychopathology and Behavioral Assessment*, 35(4), 475–486 https://doi.org/10.1007/s10862-013-9354-5

Balsamo, M., & Saggino, A. (2013). TDI: *Teate Depression Inventory manuale* [TDI: Teate Depression Inventory manual]. Bern, Switzerland: Hogrefe

Balsamo, M., & Saggino, A. (2014). Determining a diagnostic cut-off on the Teate Depression Inventory. *Neuropsychiatric Disease and Treatment*, 987. https://doi.org/10.2147/NDT.S55706

Balsamo, M., Imperatori, C., Sergi, M. R., Belvederi Murri, M., Continisio, M., Tamburello, A., Innamorati, M., & Saggino, A. (2013). Cognitive vulnerabilities and depression in young adults: an ROC curves analysis. *Depression Research and Treatment*, *2013*, 1–8. https://doi.org/10.1155/2013/407602

Balsamo, M., Carlucci, L., Sergi, M. R., Murdock, K. K., & Saggino, A. (2015). The mediating role of early maladaptive schemas in the relation between co-rumination and depression in young adults. *Plos On*e, 10(10). https://doi.org/10.1371/journal.pone.0140177

Balsamo, M., Carlucci, L., Sergi, M., Saggino, A. (2016) Validazione della versione italiana del co-rumination questionnaire [Validation of the Italian version of the Co-Rumination Questionnaire]. Ital J *Cognitive Behavior*. https://doi.org/10.1037/t51826-000

Balsamo, M., Innamorati, M., Dam, N. T. V., Carlucci, L., & Saggino, A. (2015). Measuring anxiety in the elderly: psychometric properties of the State Trait Inventory of Cognitive and Somatic Anxiety (STICSA) in an elderly Italian sample. *International Psychogeriatrics*, 27(6), 999–1008. https://doi.org/10.1017/S1041610214002634

Balsamo, M., Macchia, A., Carlucci, L., Picconi, L., Tommasi, M., Gilbert , P., Saggino A., (2015) Measurement of external shame: an inside view. *Journal of Personality Assessment*, *97*(1), 81-89. https://doi.org/10.1080/00223891.2014.947650

Barr, L. C., Markowitz, J. C., & Kocsis, J. H. (1992). The General Behavior Inventory as an outpatient screen for dysthymic disorder. *Journal of Psychopathology and Behavioral Assessment*, *14*(4), 337–342. https://doi.org/10.1007/BF00960778

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck depression inventory-II*. San Antonio, TX. Psychological Corporation. https://doi.org/10.1037/t00742-000

Berkowitz, L. (1989). Frustration-aggression hypothesis: examination and reformulation. *Psychological Bulletin*, *106*(1), 59–73. https://doi.org/10.1037/0033-2909.106.1.59

Brookins, G. K., Petersen, A. C., & Brooks, L. M. (1997). Youth and families in the inner city: Influencing positive outcomes. In H. J. Walberg, O. Reyes, & R. P. Weissberg (Eds.), *Children and youth: Interdisciplinary perspectives* (pp. 45–66). Thousand Oaks, CA: Sage. https://doi.org/10.1023/B:JCFS.0000022037.59369.90

Blumberg, S., Clarke, T., & Blackwell, D. (2015). Racial and ethnic disparities in men's use of mental health treatments. National Center for Health Statistics; Center of Disease Control. https://www.cdc.gov/nchs/data/databriefs/db206.pdf

Bunni, D. (2019). Construct *Validity of the Teate Depression Inventory (TDI) with a Middle Eastern/Arab American Sample*. Eastern Illinois University, Charleston, Illinois.

Carter, S. E., & Walker, R. L. (2014). Anxiety Symptomatology and Perceived Health in African American adults: Moderating role of emotion regulation. *Cultural Diversity and Ethnic Minority Psychology*, *20*(3), 307–315. https://doi.org/10.1037/a0035343

Chapman, L. K., Kertz, S. J., & Woodruff-Borden, J. (2009). A structural equation model analysis of perceived control and psychological distress on worry among African American and European American young adults. *Journal of Anxiety Disorders*, *23*(1), 69–76. https://doi.org/10.1016/j.janxdis.2008.03.018

Chrishon, K., Anderson, D., Arora, G., & Bailey, T.-K. (2012). Race and psychiatric diagnostic patterns: understanding the influence of hospital characteristics in the national hospital

Discharge Survey. *Journal of the National Medical Association*, *104*(11-12), 505–509. https://doi.org/10.1016/s0027-9684(15)30216-9

Comunian, A L. (2004) State-Trait Anger Expression lnventory-2, Florence, Italy: Organizzazioni Speciali.

Cooper, L. A., Gonzales, J. J., Gallo, J. J., Rost, K. M., Meredith, L. S., Rubenstein, L. V., Wang, N.-Y., & Ford, D. E. (2003). The acceptability of treatment for depression among african-american, hispanic, and white primary care patients. *Medical Care*, *41*(4), 479–489. https://doi.org/10.1097/01.MLR.0000053228.58042.E4

Cummings, C. M., Caporino, N. E., & Kendal, P. C. (2014). Comorbidity of anxiety and depression in children and adolescents: 20 years after. *Psychological Bulletin*, *140*(3), 816–845. https://doi.org/10.1037/a0034733

Depue, R. (1987). *General Behavior Inventory*. Ithaca, NY: Department of Psychology, Cornell University.

Depue, R. A., Krauss, S., Spoont, M. R., & Arbisi, P. (1989). General Behavior Inventory identification of unipolar and bipolar affective conditions in a nonclinical university population. *Journal of Abnormal Psychology*, *98*(2), 117–126. https://doi.org/10.1037/0021-843X.98.2.117

Evans, N. T., & Sheu, J.-J. (2018). The relationships between perceived discrimination and utilization of mental health services among African Americans and Caribbean blacks. *Journal of Immigrant and Minority Health*, *21*(6), 1241–1247. https://doi.org/10.1007/s10903-018-0836-0

Garber, J., & Weersing, V. R. (2010). Comorbidity of anxiety and depression in youth: implications for treatment and prevention. *Clinical Psychology: Science and Practice*, *17*, 293–306. https://doi.org/10.1111/j.1468-2850.2010.01221.x

Garland, A. F., Lau, A. S., Yeh, M., Mccabe, K. M., Hough, R. L., & Landsverk, J. A. (2005). Racial and ethnic differences in utilization of mental health services among high-risk

youths. *American Journal of Psychiatry*, *162*(7), 1336–1343. https://doi.org/10.1176/appi.ajp.162.7.1336

Garrison, C. Z., Jackson, K. L., Marsteller, F., Mckeown, R., & Addy, C. (1990). A longitudinal study of depressive symptomatology in young adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *29*(4), 581–585. https://doi.org/10.1097/00004583-199007000-00011

González, H. M., Tarraf, W., Whitfield, K. E., & Vega, W. A. (2010). The epidemiology of major depression and ethnicity in the United States. *Journal of Psychiatric Research*, 44(15), 1043–1051. https://doi.org/10.1016/j.jpsychires.2010.03.017

Grös, D. F., Antony, M. M., Simms, L. J., & McCabe, R. E. (2007). Psychometric properties of the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA): comparison to the state-trait anxiety inventory (STAI). *Psychological Assessment*, *19*(4), 369-381. https://doi.org/10.1037/1040-3590.19.4.369

Goss, K., Gilbert, P., & Allan, S. (1994). An Exploration of Shame Measures—I: The Other as Shamer Scale. *Personality and Individual Differences*, *17*(5), 713–717. https://doi.org/10.1016/0191-8869(94)90149-X

Hammack, P. L., Robinson, W. L., Crawford, I., & Li, S. T. (2004). Poverty and depressed mood among urban African–American adolescents: A family stress perspective. *Journal of Child and Family Studies*, *13*(3). https://doi.org/10.1023/B:JCFS.0000022037.59369.90

Heeringa, S. G., Wagner, J., Torres, M., Duan, N., Adams, T., & Berglund, P. (2004). Sample designs and sampling methods for the Collaborative Psychiatric Epidemiology Studies (CPES). Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/15719530 https://doi.org/10.1002/mpr.179

Hirschfeld, R. M., (2001). The comorbidity of major depression and anxiety disorders: recognition and management in primary care. *Primary care companion to the Journal of clinical psychiatry*, *3*(6), 244–254. https://doi.org/10.4088/PCC.v03n0609

Huberty, T. J. R. (2012). Anxiety and depression in children and adolescents: Assessment, intervention, and prevention. New York: Springer.

Innamorati, M., Tamburello, S., Contardi, A., Imperatori, C., Tamburello, A., Saggino, A., & Balsamo, M. (2013). Psychometric Properties of the Attitudes toward Self-Revised in Italian Young Adults. *Depression Research and Treatment, 2013*, 1–6. https://doi.org/10.1155/2013/209216

Kataoka, S. H., Zhang, L., & Wells, K. B. (2002). Unmet need for mental health care among U.S. children: variation by ethnicity and insurance status. *American Journal of Psychiatry*, *159*(9), 1548–1555. https://doi.org/10.1176/appi.ajp.159.9.1548

Kilbourne, A. M., Haas, G. L., Mulsant, B. H., Bauer, M. S., & Pincus, H. A. (2004). Concurrent psychiatric diagnoses by age and race among persons with bipolar disorder. *Psychiatric Services*, *55*(8), 931–933. https://doi.org/10.1176/appi.ps.55.8.931

Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-Month DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry*, *62*(6), 617. https://doi.org/10.1001/archpsyc.62.6.617

Pendergast, L. L., Youngstrom, E. A., Merkitch, K. G., Moore, K. A., Black, C. L., Abramson, L. Y., & Alloy, L. B. (2014). Differentiating bipolar disorder from unipolar depression and ADHD: The utility of the General Behavior Inventory. *Psychological Assessment*, *26*(1), 195–206. https://doi.org/10.1037/a0035138

Powell, W., Richmond, J., Mohottige, D., Yen, I., Joslyn, A., & Corbie-Smith, G. (2019). Medical mistrust, racism, and delays in preventive health screening among African-American men. *Behavioral Medicine, 45* (2), 102–117. https://doi.org/10.1080/08964289.2019.1585327

Last, C. G., & Perrin, S. (1993). Anxiety disorders in African-American and white children. *Journal of Abnormal Child Psychology*, *21*(2), 153–164. https://doi.org/10.1007/BF00911313

Lancaster, S. L., Melka, S. E., Klein, K. P., & Rodriguez, B. F. (2015). Ethnicity and anxiety: a psychometric evaluation of the STICSA. *Measurement & Evaluation in Counseling & Development, 48*(3), 163–176. https://doi.org/10.1177/0748175615578757

Lukachko, A. , Myer, I. & Hankerson, S. (2015). Religiosity and mental health service utilization among African-Americans. *The Journal of Nervous and Mental Disease, 203*(8), 578–582. https://doi.org/10.1097/NMD.0000000000000334

Metz, C. E. (1978). Basic principles of ROC analysis. *Seminars in Nuclear Medicine, 8*(4), 283–298. https://doi.org/10.1016/S0001-2998(78)80014-2

Neighbors, H. W., Caldwell, C., Williams, D. R., Nesse, R., Taylor, R. J., Bullard, K. M., Torres, M., & Jackson, J. S. (2007). Race, ethnicity, and the use of services for mental disorders. *Archives of General Psychiatry*, *64*(4), 485. https://doi.org/10.1001/archpsyc.64.4.485

O'Garro-Moore, J. K., Adams, A. M., Abramson, L. Y., & Alloy, L. B. (2015). Anxiety comorbidity in bipolar spectrum disorders: The mediational role of perfectionism in prospective depressive symptoms. *Journal of Affective Disorders*, *174*, 180–187. https://doi.org/10.1016/j.jad.2014.11.024

Georg Rasch. (1960). *Studies in mathematical psychology. 1, Probabilistic models for some intelligence and attainment tests*. Danmarks Pædagogiske Institut.

Ree, M. J., MacLeod, C., French, D., & Locke, V. (2000). The State–Trait Inventory for Cognitive and Somatic Anxiety: Development and validation. Poster session presented at

the annual meeting of the Association for the Advancement of Behavior Therapy, New Orleans, LA.

Ree, M. J., French, D., Macleod, C., & Locke, V. (2008). Distinguishing cognitive and somatic dimensions of State and Trait Anxiety: Development and validation of the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA). Behavioural and Cognitive Psychotherapy, *36*(03). https://doi.org/10.1017/S1352465808004232

Ree, M J., MacLeod, C., French, D., & Locke, V. (2000). State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA). Australia: The University of Western Australia.

Reynolds, C., (1997). Revised Children's Manifest Anxiety Scale, [Measurement instrument]. Torrance: WPS Western Psychological Services

Ruan, L., Liao, P.C., Jones, P.C., & Pendergast, L.L. (2016). Reliability and convergent validity of scores from the Teate Depression Inventory. 2016 American Psychological Association Annual Convention.

Rushworth, S., (2017) *Construct Validity of the Teate Depression Inventory (TDI) with Black African American Sample.* Eastern Illinois University, Charleston, Illinois.

Sanavio, E. (1988). Obsessions and compulsions: the Padua Inventory. *Behaviour Research and Therapy, 26*(2), 169-177. https://doi.org/10.1016/0005-7967(88)90116-7

Serafini, G., Geoffroy, P. A., Aguglia, A., Adavastro, G., Canepa, G., Pompili, M., & Amore, M. (2017). Irritable temperament and lifetime psychotic symptoms as predictors of anxiety symptoms in bipolar disorder. *Nordic Journal of Psychiatry, 72*(1), 63–71. https://doi.org/10.1080/08039488.2017.1385851

Spitzer, R . L. (1979). Schedule for affective disorders and schizophrenia: lifetime version. New York, NY: New York State Psychiatric Institute.

Spitzer, R. L., First, M. B., Gibbon, M., & Williams,J. B. (1989). Structured Clinical Interview for DSM-111-R: Patient Edition (SCID-P). New York, NY: New York State Psychiatric

Institute

Strakowski, S. M., Keck, P. E., Arnold, L. M., Collins, J., Wilson, R. M., Fleck, D. E., … Adebimpe, V. R. (2003). Ethnicity and diagnosis in patients with affective disorders. *The Journal of Clinical Psy*chiatry, *64*(7), 747–754. https://doi.org/10.4088/JCP.v64n0702

Swets, J. A. (1988). Measuring the accuracy of diagnostic systems. Science, 240, 1285-1293 https://doi.org/10.1126/science.3287615

Swets, J. A. (19-92). The science of choosing the right decision threshold in high-stakes diagnostics. *American Psychologist, 47,* 522-532 https://doi.org/10.1037/0003-066X.47.4.522

Turner, E. A., Jensen-Doss, A., & Heffer, R. W. (2015). Ethnicity as a moderator of how parents' attitudes and perceived stigma influence intentions to seek child mental health services. *Cultural Diversity and Ethnic Minority Psychology*, *21*(4), 613–618. https://doi.org/10.1037/cdp0000047

Ward, E. C., & Brown, R. L. (2015). A culturally adapted depression intervention for African American adults experiencing depression: Oh Happy Day. *American Journal of Orthopsychiatry*, *85*(1), 11–22. https://doi.org/10.1037/ort0000027

Ware, J., Kosinski, M., & Keller, S. D. (1996). A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Medical Care*, *34*(3), 220–233. https://doi.org/10.1097/00005650-199603000-00003

Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-ltem Short-Form Health Survey (SF-36). *Medical Care*, *30*(6), 473–483. https://doi.org/10.1097/00005650-199206000-00002

Wells, K., Klap, R., Koike, A., & Sherbourne, C. (2001). Ethnic disparities in unmet need for alcoholism, drug abuse, and mental health care. *American Journal of Psychiatry*, *158*(12), 2027–2032. https://doi.org/10.1176/appi.ajp.158.12.2027

Williams, J., Peeters, F., & Zautra, A. (2004). Differential affect structure in depressive and anxiety disorders. *Anxiety, Stress & Coping*, *17*(4), 321–330. https://doi.org/10.1080/10615800412331318634

U.S. Census Bureau. (2009). *Annual estimates of the resident population by sex, race, and Hispanic origin for the United States:* April 1, 2000 to July 1, 2009 (NC-EST2009-03). Retrieved from http://www.census.gov/popest/data/ historical/2000s/vintage_2009/

Yesavage, J. A. *et al.* (1982). Development and validation of a geriatric depression screening scale: a preliminary report. *Journal of Psychiatric Research*, *17*, 37–49. https://doi.crossref.org/simpleTextQuery#:~:text=https%3A//doi.org/10.1016/0022-3956(82)90033-4

Appendix

A1

Construct Validity Coefficients for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory for the Total Sample (N = 271)

	TDI				STICSA				GBI	
Variable	Total	DM	LS	DF	TC	TS	SC	SS	D	H/B
TDI										
Total	–									
Depressive Mood	.89**	–								
Life Satisfaction	.86**	.55**	–							
Daily Functioning	.76**	.49**	.78**	–						
STICSA										
Trait Cognitive	.44**	.59**	.16**	.15*	–					
Trait Somatic	.29**	.42**	.06	.11	.62**	–				
State Cognitive	.48**	.61**	.21**	.20**	.84**	.57**	–			
State Somatic	.31**	.39**	.13*	.19**	.52**	.75**	.65**	–		
GBI										
Depression	.78**	.83**	.53**	.44**	.66**	.53**	.62**	.46**	–	
Hypomania/Biphasic	.64**	.64**	.48**	.42**	.52**	.47**	.49**	.43**	.84**	–

Note. TDI = Teate Depression Inventory, STICSA = State Trait Inventory for Cognitive and Somatic Anxiety, GBI = General Behavior Inventory, DM = Depressed Mood, LS = Life Satisfaction, DF = Daily Functioning, TC = Trait Cognitive, TS = Trait Somatic, SC = State Cognitive, SS = State Somatic, D = Depression, H/B = Hypomania/Biphasic.

*p < .05, **p< .01

A2

Construct Validity Coefficients for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory for the Total Sample (N = 271)

	TDI				STICSA				GBI	
Variable	Total	DM	LS	DF	TC	TS	SC	SS	D	H/B
TDI										
Total	–									
Depressive Mood	.89**	–								
Life Satisfaction	.86**	.55**	–							
Daily Functioning	.76**	.49**	.78**	–						
STICSA										
Trait Cognitive	.44**	.59**	.16**	.15*	–					
Trait Somatic	.29**	.42**	.06	.11	.62**	–				
State Cognitive	.48**	.61**	.21**	.20**	.84**	.57**	–			
State Somatic	.31**	.39**	.13*	.19**	.52**	.75**	.65**	–		
GBI										
Depression	.78**	.83**	.53**	.44**	.66**	.53**	.62**	.46**	–	
Hypomania/Biphasic	.64**	.64**	.48**	.42**	.52**	.47**	.49**	.43**	.84**	–

Note. TDI = Teate Depression Inventory, STICSA = State Trait Inventory for Cognitive and Somatic Anxiety, GBI = General Behavior Inventory, DM = Depressed Mood, LS = Life Satisfaction, DF = Daily Functioning, TC = Trait Cognitive, TS = Trait Somatic, SC = State Cognitive, SS = State Somatic, D = Depression, H/B = Hypomania/Biphasic.

*$p < .05$, **$p < .01$