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Construct Validity of the Teate Depression Inventory (TDI) with a Middle Eastern/Arab American Sample

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**Construct Validity of the Teate Depression Inventory (TDI) with
a Middle Eastern/Arab American Sample**

(TITLE)

BY

Dalia Bunni

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Construct Validity of the Teate Depression Inventory (TDI) with a Middle Eastern/Arab
American Sample

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Abstract

The purpose of the study was to examine the construct validity of a newer test used to measure depressive symptoms, the Teate Depression Inventory (TDI). The primary focus of the study was on Middle Eastern/Arab Americans (ME/AA). Previous research has demonstrated that ethnic minority groups may experience and present internalizing disorders, such as depression and anxiety differently than the majority ethnic group, White/Caucasian (W/C) individuals. Further, research suggests that there is a disparity in mental health care among ethnic minority groups, starting with detecting and diagnosing mental health disorders. Inaccurate detection and diagnoses informs inaccurate treatment, further creating a disparity. Research of this nature is imperative to ensure ethnically diverse groups are receiving proper treatment by first ensuring the measurement tools used to detect and diagnosis internalizing disorders demonstrate strong psychometric properties. Previous research has demonstrated support for the construct validity of the TDI; however, there is limited research on its use with ethnically diverse groups.

The present study addressed the following: 1) Is the TDI a valid measure of depression in Middle Eastern/Arab Americans? 2) Does the TDI demonstrate convergent and discriminant validity with the General Behavior Inventory (GBI) and State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA)? It was predicted that the TDI and GBI Depression scales would produce higher validity coefficients, demonstrating convergent validity, while the TDI and STICSA and TDI and GBI Hypomanic/Biphasic scales would produce lower validity coefficients, demonstrating discriminant validity. Overall Convergent validity coefficients between TDI and GBI Depression scores were

larger than discriminant validity coefficients for the total sample, ME/AA participants, and W/C participants. No significant differences were found between scores obtained by ME/AA participants and W/C participants, indicating that the TDI appeared to measure depression symptoms in ME/AA individuals similar to W/C participants. Results suggested support for the construct validity of the TDI with use among ethnically diverse individuals. Limitations such as sample size, self-reporting, and representativeness were noted.

Construct Validity of the Teate Depression Inventory (TDI)

with a Middle Eastern/Arab American Sample

The primary focus of the current study was to provide insight into the use of the Teate Depression Inventory and the State-Trait Inventory for Cognitive and Somatic Anxiety with Middle Eastern/Arab Americans. Ethnic minority group members are at an increased risk for mental health disorders, and this is often due to culture and environmental factors. Given what is known about the mental health and ethnic minority groups, it is imperative that assessments are valid and reliable with all individuals to ensure best practice and ethical decision making.

Internalizing Disorders

Internalizing disorders are characterized by distress that is experienced internally within the individual (Tandon, Cardeli, & Luby, 2009). Many symptoms are covert and often may go unnoticed by others. Depression and anxiety are among the most common internalizing disorders in the United States (Merikangas et al., 2010). Depression can affect individuals differently; some may experience Major Depressive Disorder (MDD), some may experience Persistent Depressive Disorder (PDD), and others may experience Bipolar disorder, which is vastly different than MDD and PDD. Regardless of presentation, depression and anxiety can have major adverse impacts on an individual's life and can cause disability for many (Chaudhury, Deka, & Chetia, 2006). In addition to the impact mental illness can have on an individual, mental illness creates a costly burden on society. As of 2001, depression was estimated to cost around \$43.7 to 52.9 billion dollars per year in health care and \$23.8 billion in the workplace due to excessive absenteeism and lower productivity (Woodend, Schölmerich, & Denктаş, 2015).

Furthermore, evidence shows that depression, much like other serious medical conditions, required long-term care and often resulted in patients reporting worsened physical symptoms (Pincus & Pettit, 2001). Woodend et al. (2015) also noted that depression is now the “second leading cause of disability among developing countries” (p. 1).

Mood Disorders: Depression

Depression can be an incredibly hindering disorder, regardless of the type of depression. It may leave individuals unable to participate in everyday activities such as school, work, and hobbies and can seriously impact social relationships. A key characteristic of depression, withdrawal, can strain social relationships and make an individual feel even more isolated. Individuals who withdraw may also withdraw from jobs and prior commitments that can impact their performance at work. Furthermore, depression can also cause also impact the body and worsen or cause disease. Lack of energy and fatigue are common symptoms that may hinder an individual from engaging in meaningful activities such as exercise.

Major Depressive Disorder (MDD) (American Psychiatric Association, 2013) is characterized by symptoms that last for at least two weeks. Symptoms can include lack of appetite, weight gain or loss, irritable or generally low mood, lack of energy, and fatigue (American Psychiatric Association, 2013). According to Teo et al. (2013) about 16% of the United States population suffers from MDD. Symptoms are often more severe and acute when an individual suffers with MDD than other forms of depression and have an early onset (Woodend et al, 2015). Individuals may also experience a higher

rate of comorbidity with other medical conditions because symptoms are so intense it has physiological impacts on the individual.

Persistent Depressive Disorder (PDD) (American Psychiatric Association, 2013) or dysthymic disorder is different from MDD in respect to the duration and severity of the symptoms. Diagnostic criteria for PDD includes at least two symptoms: appetite change, sleep change, low energy, low self-esteem, difficulty concentrating, and feelings of hopelessness (American Psychiatric Association, 2013). Additionally, the individual experiences depressed mood for most of the day that occurs for more days than not and lasts at least two years for adults or one year for children and adolescents. Typically, symptoms are less intense than MDD, but last much longer. Although symptoms are less intense, PDD can still greatly impact an individual's life.

Furthermore, under DSM-5 criteria it is possible for an individual to be diagnosed with PDD and experience an MDD episode; therefore, both diagnoses are possible (Gotlib & LeMoult, 2014). Distinguishing between MDD and PDD is important because it can help assist in proper treatment. For instance, because MDD is associated with more severe symptoms, there is likely to be more debilitating outcomes for individuals with this diagnosis. They may be more likely to miss work or daily activities during major depressive episodes and this may lead to greater difficulty holding a job. Moreover, these individuals typically do not experience these symptoms for extended periods of time, which may mean the individual has a hard time coping with the episode and require more inpatient care (Gotlib & LeMoult, 2014). Alternatively, individuals with PDD tend to experience milder symptoms for longer periods of time, which can

mean the individual has developed more mature coping skills and may not require professional treatment as often.

Bipolar disorder is distinguished by the presence of mania (American Psychiatric Association, 2013; Pendergast et al., 2014). A diagnosis of bipolar disorder is only possible if the individual has experienced both a depressive episode and a manic episode. Depressive episode symptoms are similar to those of unipolar depression: loss of energy, lack of appetite, irritable or low mood, etc. Symptoms of mania are characterized by intense euphoria, sensation seeking, risky behavior, lack of sleep, increase in energy, rapid thinking, and impairment in judgement (American Psychiatric Association, 2013). As of 2014, about 5.4 million young adults in the U.S. are diagnosed with bipolar disorder (Doherty & MacGeorge, 2014).

Diagnosis of bipolar disorder is difficult because individuals will often experience a depressive episode before a manic episode and are diagnosed with unipolar depression. The issue here is that medication for unipolar depression and bipolar depression is vastly different and little is known about how antidepressants work for people with bipolar depression (Pendergast et al., 2014). Symptoms of pediatric bipolar disorder look similar to Attention Deficit Hyperactivity Disorder (ADHD), making correct diagnosis difficult for younger individuals (Pendergast et al., 2014). According to Doherty and MacGeorge (2014) and Pendergast et al., (2014), symptoms typically occur during the ages of 15 and 19 years old, coinciding directly with early adulthood, making bipolar disorder even more difficult to cope with.

Bipolar disorder can be broken down into two more distinguishable categories. Bipolar I refers to an individual that has experienced at least one manic episode; manic

episode must be so severe that the individual was hospitalized or significantly impaired. Furthermore, the individual does not need to have experienced a depressive episode (Pendergast et al., 2014). Bipolar II refers to an individual who has experienced a hypomanic episode, similar to manic episode, but symptoms are not as severe, and a depressive episode (Pendergast et al., 2014).

Anxiety Disorders

Anxiety disorders have some similarities with depression. Some symptoms may overlap, which can make it difficult to distinguish the two. While there are different anxiety disorders, common symptoms include irritability, sleep disturbances, excessive worry, fatigue, and muscle tension (American Psychiatric Association, 2013). Notably, anxiety disorders are the most common psychological disorders and typically have very high rates of comorbidity (Curth et al., 2017). Anxiety can be best understood as including trait anxiety and state anxiety.

Trait anxiety is described as something that resonates within the individual, a predisposition to worry and fear (Notebaert, Clarke, & MacLeod, 2016). It is the level of anxiety someone may experience in general, everyday tasks and activities. Sometimes people may be referred to as “always being tense,” meaning that these individuals are typically always over-worried and fearful. Often, individuals with a higher level of trait anxiety react to situations more negatively than those with a lower level of trait anxiety. Effective treatment becomes crucial to consider when examining the negative impact that trait anxiety can have on an individual. Ursache and Raver (2014) found that in children with higher levels of trait anxiety, lower levels of executive functioning were observed and these deficits in executive functioning carry into adulthood as well. State anxiety is

best understood as situation based. State anxiety is an individual's reaction to a specific, threatening event. At times, state anxiety is not necessarily considered a negative thing. For example, for someone in a life-threatening situation, anxiety can aid in the flight or fight response.

Correct diagnosis and treatment of depression and anxiety are important because, while there are some similarities, there are many distinct differences that can greatly impact the treatment efficacy. Depression and anxiety can have a dramatic impact on an individual's life in many ways.

Risk Factors

Many individuals are at an increased risk for experiencing depression and/or anxiety based on the events of their life. A few of the most commonly known risk factors for depression include experiencing a dramatic life event, such as death of loved one, loss of job or home, or an event that causes unexpected drastic changes to an individual. Socioeconomic status (SES) is a frequently studied risk factor and found to have an inverse relationship with psychopathology, namely depression (Mezuk, Myers, & Kendler, 2013). Low SES can cause great stress for adults, which often gets transposed to the children. Children living in poverty or in areas of low SES face significantly more adversities than children living in moderate to high areas of SES. Furthermore, genetics plays a large role in the development of depression and individuals that have a first-degree relative with depression are at a heightened risk (Lohoff, 2011). Adolescents that experience depression are also at a risk for developing a diagnosis of MDD during adulthood because, typically, the next major depressive episode is during emerging adulthood (Sheets et al., 2014).

Ethnicity is also a risk factor. Many ethnic minority groups face various forms of discrimination including verbal and physical discrimination. Repeated instances of discrimination negatively impact an individual and can cause the individual to suffer from depression and anxiety. Furthermore, although there is a high rate of mental illness within ethnic minority groups, these groups are less likely to seek help for psychological disorders for several reasons (Sun et al., 2016), which means accurate diagnosis is that much more important. An important reason for unwillingness to seek help may be because many ethnic minority groups are fearful of or not trusting of professionals (Amer & Hovey, 2012).

Given the debilitating nature of internalizing disorders, it becomes imperative that assessments used to measure internalizing disorders are valid for diverse groups. Furthermore, demonstration of sound psychometric properties of tests can aid in building a more trusting attitude toward seeking help.

Disparity of Treatment in Ethnic Minority Populations

The United States is increasingly becoming more diverse, and with this diversity, many issues arise in the treatment quality with minority groups. It has been noted that minority groups are at an increased risk for mental illness, but typically underutilize mental health services (Waheed et al., 2015). The discrepancy between high rates of mental illness and underutilization of services is, more often than not, found among minority groups. Explanations for this discrepancy include mistrust of professionals, inequalities of care, lower SES, perceived stigma, and cultural beliefs about mental health (Anglin, Alberti, Link, & Phelan, 2008). Anglin et al., (2010) found that contrary to previous research, African American individuals had a more positive view of the

effectiveness of mental health treatment, but they also had a higher percent that believed mental health did not need professional intervention and rather it would heal itself. This idea touches on cultural differences. More often, African Americans received support from family, friends, and religious figures as opposed to professional mental health experts.

As described by D'Anna, Ponce, and Seigel (2010), socioeconomic status is one of the biggest determinants for the quality of health care one receives, and often minorities are in positions of lower socioeconomic status. As discussed earlier, lower SES is one of the biggest risk factors for mental illness. For individuals that are in a position of lower socioeconomic status, they are at increased risk for developing mental illness due to significant stressors and that are coupled with access to lower quality health care as well.

Furthermore, racial and ethnic minority groups are also faced with much more discrimination and harassment. Experiences of discrimination and harassment have been found to have a negative impact on physical and mental health and overall well-being (D'Anna et al., 2010; Padela and Heisler, 2010). For Middle Eastern/Arab Americans (ME/AA), very little research has been conducted on mental health (Amer and Hovey, 2013; Padela and Heisler, 2010), but ME/AA individuals are at risk for developing mental illness for a number of reasons. One of the major reasons ME/AA individuals are reluctant to seek help for mental health is because they are fearful it may be used against them (Amer and Hovey, 2013). ME/AA individuals, just like other ethnic groups immigrating to the United States, may have difficulty adjusting to the American culture, experience stressors related to intercultural child rearing challenges, lack knowledge on American healthcare system, and often, lose their social support network. Amer and

Hovey (2013) found that many ME/AA individuals that immigrated to the United States were fleeing conflict and war in their home country, so they arrived in the United States already suffering from PTSD, anxiety, fear, and guilt.

After the September 11th terrorist attacks, it became very well documented among ME/AA individuals that discrimination and hate crimes dramatically increased.

Following the attacks, researchers found many ME/AA individuals reported increased discrimination and harassment and increased levels of psychological distress. In a study conducted by Amer and Hovey (2013), ME/AA individuals completed the Beck Anxiety Inventory (BAI) and the Center for Epidemiologic Studies – Depression scale (CES-D) and found that over half the sample had scores on the BAI that fell in the mild to moderate range, 14% of the population scored in the moderate/severe range, and 11% scored in the severe range. Additionally, over half the sample had scores on the CES-D that were clinically elevated.

As diversity in the United States has steadily increased and will likely continue to do so, it is vital to ensure that all individuals, regardless of ethnic and racial backgrounds, are afforded the same quality mental healthcare. To ensure this, researchers and practitioners must work to break down the barriers that racial and ethnic minority groups face when seeking mental health services. This can start with guaranteeing that individuals receive accurate diagnoses that warrant the correct forms of treatment. When this is done, and more progress will be made toward recovery, individuals may begin to trust mental health professionals for the help they are seeking.

Appropriate Measurement

The Teate Depression Inventory (TDI; Balsamo & Saggino, 2013) is a recent test used to measure levels of depression. It is relatively short, containing only 21 items. The TDI was developed in part to address psychometric limitations of other tests of depression. As Balsamo and Saggino (2014) noted, many of these psychometric limitations were due to the assessment being based on theoretical assumptions. Furthermore, many of the instruments used to measure depression were over 25 years old, illustrating a need for new instruments. An emerging body of research suggested that the TDI more accurately measured depression than other common assessments (Balsamo, Giampaglia, & Saggino, 2014; Balsamo & Saggino, 2014). The State-Trait Anxiety Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, MacLeod, French, & Locke, 2000) is another newer instrument that was designed to better measure symptoms of anxiety (Ree, French, MacLeod, & Locke, 2008).

As with most aspects of mental health research, research with ethnic minority groups is lacking. While there is promising research with the TDI and STICSA (Balsamo, Giampaglia, & Saggino, 2014; Balsamo, & Saggino, 2014; Van Dam, Gros, Earleywine, & Antony 2013; Rushworth, 2016), there is a need for research to be conducted with minority groups to ensure that these individuals are receiving proper diagnoses using adequate instruments, and therefore, receiving proper treatment. Copious amounts of research have demonstrated a clear discrepancy between mental health care and treatment between Caucasians and ethnic minority groups and the first step in combating that discrepancy is ensuring mental health research encompasses information on ethnic minority groups as well. Mental health practitioners must be

culturally competent, and part of that responsibility includes using assessments and tools that have strong evidence supporting its use with ethnic minority groups.

The primary focus of this study was to explore the psychometric properties of the TDI and STICSA within the Middle Eastern/Arab American population. As previously mentioned, there is a growing need to ensure that assessments are valid for ethnically and culturally diverse individuals. More specifically, this examiner was interested in exploring the construct validity of the TDI and STICSA with a Middle Eastern/Arab American sample, adding to existing research indicated the sound psychometric properties of these scales.

Literature Review

Teate Depression Inventory

Development and Validity. The Teate Depression Inventory (TDI; Balsamo, Giampaglia, & Saggino 2014) was developed with hopes of a more psychometrically sound measurement tool for unidimensional depression. The most commonly used assessment scales for depression were roughly 25 years old, tended to be long and tedious, had less than adequate clinical efficacy, and were based on classical test theory (Balsamo & Saggino, 2014). Classical test theory has several psychometric limitations. The first limitation is the traditional scoring method that is used in classical test theory. The traditional method of scoring involves adding the score of each item, deriving a raw score, and translating the raw score to a scaled score. The issue here is that all items are weighed equally, even though some items may indicate greater severity. For example, in a measurement tool used for depression, an item that measures feeling sad is not as severe as an item that is measuring suicidal ideation (Balsamo et al., 2014). Therefore, two

individuals, one who endorses items about feeling sad and one who endorses items about suicidal ideation, may have the same total score indicating they are expressing the same severity of symptoms. This can become dangerous because one individual, endorsing suicidal ideation, will likely be experiencing greater severity of symptoms. Similarly, the total score method assumes that each item scored relates to the underlying construct equally, which may not always be the case. The TDI was developed using the Rasch model, which allows for the uniqueness and characteristics of the individual to be highlighted. Balsamo and Saggino argued that there was a lack of assessment measures that allowed for the individual characteristics of one's depression to be understood, while remaining objective. For these reasons, the Teate Depression Inventory was developed.

Balsamo et al. (2014) outlined the development of the TDI beginning with a preliminary list of items based on the Diagnostic and Statistical Manual-Fifth Edition (DSM-V; American Psychiatric Association, 2013). Five experts were asked to generate a list based on statements they had heard from their patients. There were 152 items, worded both negatively and positively, that were generated. The second step involved rating the individual items. A second group of five clinicians were asked to rate the items on a 5-point scale. The scale ranged from 0 – “not at all corresponding” to 4 – “extremely corresponding.” Items that resulted in a mean score of 2.5 and higher were retained and 41 items were deleted. The third step included five psychometricians rating the remaining 111 items on a 5-point scale. The scale ranged from 0 – “not adequate” to 4 – “extremely adequate.” These ratings resulted in 57 items being deleted. The fourth and final step involved 20 non-clinical and 20 clinical outpatient individuals rating the

remaining 54 items on comprehensibility. This resulted in 3 items being deleted and 4 items reformatted producing a total item content of 51.

The 51 items were then assessed to determine overall model fit and individual item fit and using a sample of 529 participants. Of the 529 participants, 229 were psychiatric outpatients and 300 were without mental illness. After chi-square analyses were conducted, 21 items were retained and constitute the Teate Depression Inventory (TDI). The TDI's final 21 items demonstrated fit residuals that were in the acceptable ranges -2.20 to +1.92 and demonstrated satisfactory performance. The TDI also demonstrated a high Person Separation Index of .96 that indicated the TDI was able to distinguish individuals with various severity levels of depression. It was also found that no items had item bias across sex. Item 10 was questionable as more male participants were more likely to endorse this item that related to a loss of enjoyment; however, this was not statistically significant and item 10 was retained. This is superior to other depression measures that do show items that have sex bias.

Furthermore, the item inter-correlations had a range of 0.002-0.280 and did not show correlations higher than .3, demonstrating no local dependency, while also having no evidence of multidimensionality. The clinical ($M = 0.49, SD = 1.24$) and nonclinical sample ($M = -1.44, SD = 1.22$) had significant differences in mean person location ($F = 320.13, p < 0.0001$). This means that individuals were more likely to endorse, less severe items when they were slightly or mildly depressed as opposed to individuals who were more severely depressed and were more likely to rate more severe items.

Balsamo et al. (2014) made the decision to not include items that concerned somatic symptoms, such as appetite, sleep, and energy because they argued that such

items do not provide additional information about an individual's level of depression. Furthermore, they argued, that these symptoms can be found in other diagnostic groups and endorsement of these items may lead to an increase in the number of false positive classifications. Lastly, it helps keep depression separate from anxiety where somatic symptoms are prevalent. It was noted that because these symptoms are no longer measured, the TDI no longer agrees with the DSM-IV criteria. However, the authors made clear that the TDI was not developed for clinical diagnosis, but rather a measure that provides indication of the presence and severity of depression. Therefore, the decision to not include somatic symptoms results in a more unified assessment of the unidimensionality of depression.

Shortly after the development of the TDI, Balsamo and Saggino (2014) aimed to determine cut-off scores for the TDI to be able to distinguish between various levels of depression. Cut-off scores for different levels of depression becomes important when clinicians are trying to detect mild depression. Balsamo and Saggino (2014) argued that it is much more difficult for clinicians to detect mild depression as opposed to moderate-severe depression, therefore, with the use of the cut-off scores, clinicians can better detect those individuals suffering from mild depression.

Unpublished data from a study conducted by Balsamo (2014) suggested that the TDI was a more accurate measure than current, commonly used measures. Balsamo (2014) found internal consistency of TDI to be high, significant correlations with Beck Depression Inventory II (BDI-II) and the Geriatric Depression Scale (GDS), and better discriminant validity than the BDI-II in comparison to the GDS.

In a study of 125 psychiatric outpatients, Balsamo and Saggino (2014) aimed to

determine cut-off scores for the TDI. Of the 125 psychiatric outpatients, 91 individuals experienced single episode or recurrent depression, 21 experienced mild depression, 33 experienced moderate depression, 37 were severely depressed, and 34 were non-depressed. Participants were given the TDI and the SCDI-I, a semi-structured diagnostic interview shown to have superior validity. After the participants were assessed, four groups were derived: 1) mildly depressed, 2) moderately depressed, 3) severely depressed, 4) non-depressed. Receiver operating characteristic curves were used to develop three ROC curves: “1) the non-depressed group vs the mildly depressed group; 2) the non-depressed and mildly depressed groups vs the moderately depressed group; and 3) the non-depressed, mildly depressed, and moderately depressed groups vs the severely depressed group” (Balsamo & Saggino, 2014, p. 990). Balsamo and Saggino (2014) reported the area under the curve (AUC) to determine classification accuracy. The AUC are reported as a proportion, so its value is between zero and one, with 0.5 indicating random classification accuracy, 0.9-1 indicating excellent classification accuracy, 0.8-0.9 indicating good accuracy, 0.7-0.8 indicating fair accuracy, 0.6-0.7 indicating poor accuracy, and 0.5-0.6 indicating unacceptably poor accuracy.

For the first ROC curve, non-depressed vs. mildly depressed, the AUC was 0.85 with confidence interval (CI) = 0.72-0.98. The second ROC curve, non-depressed and mildly depressed vs. moderately depressed, the AUC was 0.87 with CI = 0.79-0.98. The third ROC curve, non-depressed, mildly depressed, and moderately depressed vs. severely depressed, the AUC was 0.95 with CI = 0.91-0.98. Overall, all three ROC curves indicated that the TDI showed good to excellent classification accuracy. The first ROC curve had a cut-off score set to 21 and resulted in 0.90 classification accuracy. The

sensitivity, number of true positives, was .86, and specificity, number of true negatives, was 0.94. A cut-off score of 21 resulted in 85.7% true positives, 5.8% false-positives, and 14.2% false negatives. The second ROC curve had a cut-off score set to 35.5 and resulted in 0.90 classification accuracy. The sensitivity was .82, and specificity was 0.98. A cut-off score of 35.5 resulted in 81.8% true positives, 1.8% false-positives, and 18.2% false negatives. The third ROC curve had a cut-off score set to 49.5 and resulted in 0.88 classification accuracy. The sensitivity was .81, and specificity was 0.94. A cut-off score of 49.5 resulted in 81.1% true positives, 5.7% false-positives, and 18.9% false negatives.

Balsamo and Saggino (2014) suggested cut-off scores guidelines for those individuals that are diagnosed with major depression. For scores within the 0-21 range, individuals' depression is labeled as minimal, scores between 22-36 are labeled as mild, scores between 37-50 are labeled as moderate, and scores between 51-84 are labeled as severe. The use of these score guidelines depends on what the TDI is being used for. At times, it is safer to over identify individuals, false positives, than miss individuals, false negatives. When being use a screener to identify possible individuals experiencing depressive symptoms, it is safer to over identify individuals, even though they may not actually have depression, then to miss individuals that are experiencing depression. In this case, a lower cut-off score is desired to minimize false negatives. As mentioned earlier, many symptoms of internalizing disorders may overlap and often present similarly. For this reason, it is important to study some of these symptoms and understand how they may present themselves with various disorders.

Facets of Depression. It is well known that unique characteristics of individuals can impact how individuals experience depression. Fava, Kellnew, & Perini (1982) noted that about 30-40% of individuals with depression experience anger attacks, so it becomes clear that anger and depression are related in some way. Balsamo (2010) examined the relationship between anger, depression, and rumination and found that they are, in fact, intertwined. Rumination is described as repeated thoughts, and in the case of depression and anxiety, repeated, negative thoughts. Rumination is a common among depression and anger and it is found that rumination is associated with an increase in anger and aggressive behavior Balsamo (2010). Given what is known about rumination, anger, and depression, Balsamo (2010) predicted that rumination would be associated with anger and depression and would mediate the depression-anger relationship. Furthermore, Balsamo (2010) argued that rumination may strengthen the link between depression and anger in that individuals who engage in rumination and are more anger prone, may have an increased risk for depression. A community sample of 353 Italian adults were given the Trait-Anger scale of State-Trait Anger Expression Inventory (STAXI-2), Beck Depression Inventory-II, and Padua Inventory. The Trait-Anger scale of the STAXI-2 is designed to measure an individual's tendency display anger with a specific event. The BDI-II is a measure of depression. From the Padua Inventory, only scores from the Impaired Control Over Mental Activities (Tendency to Doubt and to Ruminates).

Balsamo (2010) found that, when controlling for depression, scores from Tendency to Doubt and to Ruminates scale correlated with Trait Anger 0.48, $p < .001$; when controlling for Trait Anger, Tendency to Doubt and to Ruminates scale correlated

with Depression 0.41, $p < .001$; when controlling for Tendency to Doubt and Ruminare, Depression and Trait Anger correlated .13, $p < .014$. Based on these results, Balsamo (2010) concluded that an individual's tendency to ruminate and doubt partially mediated the relationship between depression and anger; therefore, individuals that engage in rumination are at an increased risk for depression and anger, and anger as a symptom of their depression.

Furthermore, Balsamo et al. (2015) examined the role of co-rumination, which is described as repeated discussing negative events with another individual, and depression. In this study, Balsamo et al. (2015) administered the Co-Rumination Questionnaire (CRQ), TDI, and Young Schema Questionnaire Long Form, designed to measure early maladaptive schemas, third edition (YSQ-L3). Results supported the idea that co-rumination and depression were significantly related and researchers found that as scores increased on the YSQ-L3, scores also increased on the CRQ, indicating a positive correlation between the two.

In another separate study, Balsamo (2013) examined the relationship between personality, depression, and anger. The Cloninger Model of Personality has three dimensions: novelty seeking, harm avoidance, and reward dependency. Additionally, there are three characteristic dimensions: self-directedness, cooperativeness, and self-transcendence. In studying aspects of personality, it has been found that harm avoidance and reduced self-directedness were often correlated with clinical depression. It has also been found that clinically depressed patients often score significantly higher on harm avoidance and significantly lower on self-directedness. As such, Balsamo (2013) predicted that anger would mediate the relationship between cooperativeness, the way an

individual views others as part of the self, and depression. In line with this prediction, Balsamo (2013) argued that if this is the case, a plausible intervention for depressed individuals that are anger prone is to help develop their inner compassion for others. Two hundred and thirty Italian adults were given the State-Trait Anger Expression Inventory–2 (STAXI – 2) to measure anger, Beck Depression Inventory–II (BDI – II) to measure depression, and Temperament and Character Inventory Revised (TCI-R) to measure personality dimensions. From the TCI-R, harm avoidance, persistence, cooperativeness, and self-transcendence had significant negative correlations with depression. When anger was controlled for, the relationship between cooperativeness and depression decreased and were no longer statistically significant; therefore, it was concluded that anger completely mediated the relationship between cooperativeness and depression. This may mean that an individual who has trouble with tolerance of others and are anger prone may be at an increased risk of depression.

Cognitive vulnerabilities were also examined in their relation to depression by Balsamo et al. (2013). Balsamo et al. (2013), focused on how cognitive vulnerabilities, which are described as how an individuals' perceptions of events might serve as a protective or risk factor. For depressed individuals, cognitive vulnerabilities might mean that individual tends to view stimuli in negative, distorted ways. Balsamo et al (2013) argued that these cognitive vulnerabilities play a large part in individuals developing depression and in the maintenance of depression. Participants, 467 young adults, were administered the BDI-II, Beck Hopeless Scale (BHS), Life Orientation Test – Revised (LOT-R) and Attitudes Toward Self- Revised (ATS-R). The BHS is designed to measure cognitive components of depression. The LOT-R is designed to measure optimism. The

ATS-R is designed to measure vulnerabilities to depression. Using a scree test and Velicer's MAP test, four factors were suggested: BHS optimism, BHS Pessimism, Generalized Self-Criticism, and LOT-R Optimism. After a second-order factor analysis, two higher-order factors were derived: Optimism, which accounted for 43.3% of variance, and Pessimism/Negative Attitudes Toward Self, which accounted for 34% of variance. In terms of discriminating between individuals with various severity levels of depression, Generalized Self-Criticism discriminated individuals with moderate to severe depression from other individuals with 67% probability; however, BHS Pessimism discriminated individuals at any severity level. The results from this study indicated that there were four distinct cognitive vulnerabilities related to depression: denying optimism/endorsing high standards, endorsing pessimism, generalizing self-criticism, and denying optimism. Moreover, the results indicated that, when controlling for all other cognitive vulnerabilities, pessimism was most associated with depression and that individuals with higher levels of pessimism were 52 times more at risk for depression Balsamo et al. (2013).

Depression and anxiety, while similar in some respects, are two very different constructs and needed to be treated as such. This includes assessment and treatment. Spielberger's State-Trait Anxiety Inventory (Spielberger et al.; STAI) is one of the most commonly used anxiety measures. The STAI was designed to measure both state and trait anxiety. As previously described, state anxiety is in response to a specific event or stimuli, while trait anxiety is a steady, over vigilant response to seemingly harmless stimuli. Originally, the STAI included items that were worded in ways that were considered to also measure depression. Spielberger's theory is that individuals with high

trait anxiety tend to be discontent with themselves, which is similar to characteristics of depression. For these reasons, it is often found that the STAI has poor discriminant validity with other depression measures (Balsamo et al., 2013). In a study that explored the construct validity of the STAI, Balsamo et al administered the Beck Depression Inventory-II (BDI-II), Teate Depression Inventory (TDI), and the STAI. Results indicated that data fit a bifactor model and Balsamo et al. (2013) instead argued that the STAI measures one general negative affect. Considering the psychometric properties on one the most widely used anxiety measures, it became vital for new measures to be developed.

Rushworth (2016) examined the construct validity of the TDI by exploring the convergent and discriminant validity with the State Trait Inventory for Cognitive and Somatic Anxiety (Ree et al., 2000; STICSA) and the General Behavior Inventory (GBI; Depue, 1987) among a Black/African American sample. Participants, much like the current study, were administered the TDI, STICSA, and GBI in random, counter-balanced order. Convergent validity coefficients between the TDI and the STICSA Trait and State Cognitive scales were higher, and discriminant validity coefficients between TDI and STICSA Trait and Somatic scales were lower. Additionally, the convergent validity coefficients between the TDI and GBI Depression scale were statistically high and similar for both Black/African American participants and White/Caucasian participants, while the discriminant validity coefficients between the TDI and GBI Hypomanic/Biphasic scales were lower. The results obtained provided further support for the TDI's construct validity and use with ethnically diverse individuals.

State Trait Inventory for Cognitive and Somatic Anxiety

Development and Validity. The State Trait Inventory for Cognitive and Somatic Anxiety (Ree, MacLeod, French, & Locke, 2000; STICSA) was developed to improve on the State-Trait Anxiety Inventory (Gros, Antony, & Simms, 2007; Spielberger et al., 1983; STAI). Research by Gros et al. (2007) indicated that the psychometric properties of the STICSA suggested it was a purer measure of anxiety and it allowed for more specific measurement. It is important to make the distinction between cognitive and somatic anxiety because the display of symptoms is vastly different, and this can help inform treatment. Furthermore, two individuals who score the same score on an anxiety measure may present symptoms differently and this can impact their responses and response to treatment (Ree, French, MacLeod, & Locke, 2008). Somatic anxiety symptoms can include sweating, shakiness, stiffness, muscle tension, and hyperventilation. These symptoms are known as physiological symptoms. Cognitive symptoms, which may be more well known, include distorted thought processes, excessive worry, lack of concentration, and intrusive thoughts (Ree et al., 2008). Ree et al. (2008) conducted four studies to examine the psychometric properties of the STICSA.

The first study reported on the development of the STICSA. The first step in development was compiling 131 items generated by several professionals who referred to their knowledge about anxiety and their experience. The list of 131 items were given to clinical psychology graduate students for inspection and no additional items were added or deleted. This list was provided to eight clinical psychology graduate students and they rated each item based on how clearly or ambiguously it reflected cognitive or somatic anxiety. Sixty-two items were retained, and these were included in the preliminary

questionnaire. The questionnaire was completed by 576 individuals and items were retained if they resulted in a mean score of at least 1.25 and below 3.75 to avoid floor and ceiling effects. Items that were correlated .50 with its dimension were retained and any items that had correlations of .45 or above were examined. The item that had the closest score to mid-point range was kept. This resulted in 26 items; 14 items were cognitive, and 12 items were somatic. When confirmatory factor analysis was conducted on the trait scale, a correlated two-factor model resulted in acceptable fit. Between the two models – one-factor vs. two-factor model, the chi square difference between the two models was significant ($\chi^2(1) = 711.13, p < .001$) and was in favor of the two-factor model. No items cross-loaded on multiple factors. Similar results were found when confirmatory factor analysis was conducted on the state scale. The chi square difference between the two models was significant ($\chi^2(1) = 103.70, p < .01$) and favored the two-factor model. Results also indicated that the split-half reliability was 0.90 and 0.88 for the cognitive and somatic scale, respectively. The results from the first study demonstrated the ability of the STICSA to differentiate cognitive and somatic dimensions of anxiety.

The second study was conducted to determine the replication of the STICSA factor structure. The aim was to replicate the findings of the first study. Six hundred and eighty-seven individuals completed the trait scale of the STICSA and 225 individuals completed the state scale of the STICSA. Similar to the first study, the chi square difference between the models favored the correlated two-factor model, ($\chi^2(1) = 103.70, p < .01$) and ($\chi^2(1) = 136.27, p < .01$), cognitive and somatic respectively. Furthermore, the somatic anxiety scale had an internal consistency reliability coefficient of 0.94 ($p <$

.01) and the cognitive scale had a reliability coefficient of 0.95 ($p < .01$). Ree et al (2008) also examined convergent and divergent validity. When comparing scores of the STICSA with the BDI-II and the STAI, the STICSA demonstrated greater convergent and divergent validity. The STICSA state scale scores, cognitive and somatic, were more highly correlated with the STAI than the BDI-II, $t(225) = 2.10, p < .05$. The STICSA had lower correlations with the BDI-II, a depression inventory, $t(225) = 1.63, p < .06$. Furthermore, the STICSA trait scale scores, cognitive and somatic, were more highly correlated with the STAI scores, $t(686) = 3.45, p < .01$, than they were with the BDI-II scores, $t(686) = 1.40, p < .08$. These results demonstrate that the STICSA produced scores more closely related to existing anxiety measures than depression measures. This study provided additional support for two distinct factors; cognitive and somatic (Ree et al., 2008).

The third study conducted by Ree et al. (2008) explored the predictive validity of the STICSA. In this study, the authors examined if the state scale predicted an increase in state anxiety during a known stressful situation and if the level of trait anxiety predicted a rise in state anxiety during a known stressful situation. During the first administration, participants completed the STICSA during a neutral time (no stressful events) and correlations between the trait cognitive and trait somatic was 0.54, and the correlations for state cognitive and state somatic was 0.67. During the second administration, participants completed the STICSA immediately before final school examinations (perceived stressful event) and correlations for trait cognitive and trait somatic was 0.64 and for state cognitive and state somatic was 0.58. Results also showed that mean scores were higher for cognitive scales rather than state scales, $F(1, 128) =$

257.9, $p < .01$. Furthermore, mean scores were higher during time two, examination period, $F(1, 128) = 12.58, p < .01$. Additionally, mean scores for state scales during examination period were higher, $F(1,128) = 172.23, p < .01$, but trait scores did not significantly differ. These results indicated that trait anxiety in individuals tended to remain stable even in the presence of a stressful event, but state anxiety typically increased. Multiple regression analyses were conducted to determine if trait scales predicted state scale scores. Results indicated that at initial testing, the neutral time, trait cognitive scores predicted 5.2% variance in state cognitive scores and 5.4% state somatic scores during the school examination time. Trait somatic baseline scores did not predict any significant amount of variance during time two. The results from this study demonstrated that, while the STICSA trait cognitive scale was able to predict scores on state cognitive and state somatic, the trait somatic scale was not able to predict elevations in state cognitive or state somatic scores. This study focused on cognitive stressor, therefore, conclusions cannot be made regarding somatic stressors (Ree et al., 2008).

A fourth and final study was conducted to examine predictive validity using a somatic stressor, inhalation of CO₂ enriched air. During the first administration, participants were introduced to the CO₂ enriched air and then asked to complete the STICSA, during a neutral time (no examinations). Participants were then asked to complete the STICSA a second time during the school examination period. Results from a two-way repeated measures ANOVA indicated that scores were elevated during the school examination period, $F(1,31) = 7.28, p < .01$. Additionally, trait somatic scores predicted additional variance in state cognitive scores, $F(1,40) = 4.53, p < .05$ and state somatic scores, $F(1,40) = 6.24, p < .02$ following the exposure to CO₂ enriched air. Trait

cognitive scores did not predict state cognitive or somatic scores. In summary, trait cognitive scales, but not trait somatic, did well in accounting for additional variance for state cognitive and state anxiety.

The research conducted on the STICSA has focused primarily on a majority Caucasian population. This is problematic when considering ethnically different groups who may experience mental illness differently. Lancaster, Melka, Klein, and Rodriguez (2015) stated that African American individuals are likely to endorse somatic symptoms rather than cognitive symptoms. As mentioned earlier, it is important to differentiate between somatic and cognitive anxiety because the presentation of anxiety may drastically differ and inform treatment. Lancaster et al. (2015), explored the convergent validity of the STICSA while comparing the scores of Caucasian individuals with African Americans. Results from this study indicated that African Americans had higher trait cognitive scores $t(164) = 4.53, p < .001$ and state cognitive scores, $t(164) = 5.96, p < .001$ than somatic anxiety. Trait cognitive scores were least related to depression, which may indicate that the cognitive domain better measures anxiety for African Americans than Caucasians (Lancaster et al., 2015). Although this study focused specifically on African Americans, it is important to note that other ethnic groups need to be studied as well.

Anxiety may develop later in life and is becoming more common (Balsamo, Innamorati, Van Dam, Carlucci, & Saggino, 2015). Although anxiety later in life is becoming more prevalent, current measures are typically standardized and normed on younger individuals and may not distinguish between anxiety from other health-related impairments. This may be a result of older individuals experiencing greater cognitive decline and increased health-related impairments that may make it more difficult to

assess somatic anxiety or general medical issues. It has also been reported that most anxiety measures have difficulty differentiating depression and anxiety. Balsamo et al. (2015) explored the use of the STICSA with an elderly population. A sample of 396 elderly individuals with a mean age of 69 were given the STICSA, TDI, Geriatric Depression Scale (GDS; Yesavage, Brink, Rose, Huang, Lum, Adey, & Leirer, 1982; GDS), and the short-form-12 (SF-12) Health Survey (Ware, Kosinski, Keller, 1996; SF-12). The short form was designed to be less cumbersome to compare groups with multiple health dimensions.

Balsamo et al. (2015) used confirmatory factor analysis to test four underlying models of the STICSA: one-factor model (Model 1), two-factor model (Model 2), two-factor model where items loaded on either cognitive or somatic factors (Model 3), four-factor model; State-Cognitive (STICSA-SC), State-Somatic (STICSA-SS), Trait-Cognitive (STICSA-TC), and Trait-Somatic factors (STICSA-TS) (Model 4). Results indicated that Model 4 showed adequate-to-excellent fit. Moreover, the STICSA demonstrated higher correlation with the GDS ($r = 0.56$) than other measures of depression. This study indicated that the STICSA demonstrated the ability to discriminate anxiety and physical health problems.

Given what is known about the importance of differentiating cognitive and somatic anxiety, the STICSA includes scores with reliable and valid measurement for use with individuals. While the present research on the STICSA is promising, it is vital that more research be conducted on individuals from various ethnic backgrounds.

General Behavior Inventory

Development. Unipolar depression and bipolar depression have many similar elements, however, there are important differences such as the presence of mania with bipolar depression. The measure of the both, therefore, need to be separate and valid. The General Behavior Inventory (GBI; Depue, 1987) was designed to measure both depression and mania. Depue et al. (1985) studied the GBI by considering biological markers in individuals identified with cyclothymia. Originally, the GBI consisted on 69 items and a cut score of 27 that was derived for three separate groups: non-patients, psychiatric outpatients, and offspring of patients with bipolar I disorder. The original GBI was administered to 850 university students and 126 students were also administered the Schedule for Affective Disorders and Schizophrenia, Lifetime Version (Spitzer, 1979; SADS-L). After the SADS-L and GBI were completed, individuals were blindly assessed and classified using criteria similar to the Diagnostic and Statistical Manual-Third Edition (DSM-III; American Psychiatric Association, 1980). The final sample of 15 individuals with cyclothymia and seven control individuals were given the BDI prior to the administration of the GBI. This was done so that current levels of depression were reported.

In order to control for circadian effects and cortisol levels, testing began at 1:00 p.m. because cortisol levels are near average for almost all individuals regardless of psychiatric disorders and lasted three hours. Participants' blood was drawn at the beginning of the testing and participants were then able to rest for one hour. Then, participants completed a trivial stressor which involved a multiplication and division math test followed by 90 minutes of rest. When testing was completed, the participants

stated any life events they or someone close to them experienced and rated their level of stress to these items. Individuals in the cyclothymia group were found to have significantly higher rates of cortisol secretion than the control group and the two groups studied did not significantly differ in the number or magnitude of their reported life events. Results indicated that the number of depressive items endorsed on the GBI had a significant correlation with cortisol levels, ($r = 0.42, p < 0.05$). When cortisol was measured during the recovery periods, the correlation between GBI depressive items and cortisol levels increased, ($r = 0.78, p < 0.01$). During the study, individuals with cyclothymia had lower serum free cortisol secretion, which may indicate malfunctioning in tonic inhibitory modulation system of cortisol secretion (Depue et., 1985). Given these results, the GBI may be able to identify at-risk individuals, based on biological evidence, for bipolar disorders.

Barr, Markowitz, and Kocsis (1992) explored the use of the GBI as a screening measure for affective illness, more specifically, dysthymic disorder. Dysthymic disorder is best understood as what is now Persistent Depressive Disorder. Symptoms include many common depression symptoms, low energy, decreased interest in activities, weight loss or gain, change in appetite, and poor concentration, also have been present for at least two years (Barr et al., 1992). It is critical to identify these symptoms early so appropriate treatment can be sought. If left untreated, many individuals may be at an increased risk for certain medical conditions such as lung, back, and gastrointestinal diseases (Barr et al., 1992). Initially, the GBI was developed to measure symptoms of bipolar disorder, but altered to include items that measure unipolar depression, therefore, Barr et al. (1992) wanted to explore its utility as a screener for dysthymic disorder.

Specificity and sensitivity need to be examined in instruments that are being used as a screener. Specificity is described as the number of true negative scores identified, given an individual does not have a diagnosis of the target disorder. Sensitivity is described as the number of true positive scores identified, given that an individual does have a diagnosis of the target disorder.

Fifty-nine participants in an outpatient clinic were administered the GBI and then interviewed using the Structured Clinical Interview for DSM-III Patient Version (SCID-P; Spitzer & Williams, 1989). Barr et al. (1992) then diagnosed participants. Twenty-eight participants new to the clinic were also administered the GBI and the interview. The GBI demonstrated relatively poor sensitivity, 61%, and slightly better specificity, 88%. Moreover, the GBI demonstrated positive predictive power of 76.9% and negative predictive power of 73%.

In comparing the GBI with the BDI, Wold (1990) focused on exploring the general utility of the GBI. A total of 98 individuals seen in a private practice were given the BDI and GBI. There was a total of 22 patients that had a clinical diagnosis of bipolar disorder and the GBI correctly identified 20 (91%) of those individuals in comparison to the BDI, which was only able to identify 15 (69%) of those individuals. The GBI was able to correctly identify 21 of the 28 (75%) individuals with unipolar depression, while the BDI was able to correctly identify 25 (89%) of those individuals. However, the GBI identified an additional seven individuals that demonstrated elevations in hypomania that the clinical interview did not identify. This indicated that the GBI is effective in identifying major affective disorder, specifically hypomania symptomology that was not otherwise identified.

Generalizability. The GBI has demonstrated clinical utility in samples of adults, but often children and adults display different symptomology, therefore, an instrument that has demonstrated utility in an adult sample cannot and should not be assumed to demonstrate utility in a sample of adolescents. Findling et al. (2002) examined the utility of the GBI in differentiating children and adolescents with mood disorders from other children and adolescents. It is common for adolescents who have mood disorders such as depression or anxiety to also display symptoms of behavior disorders, which may lead to misdiagnosis or overlooking mood disorders entirely (Findling, 2002). A sample of 196 children and adolescents completed the Schedule for Affective Disorders and Schizophrenia for School Age Children – Present and Lifetime Version (K-SADS-PL; Kaufman et al., 1997). Based on diagnostic interviews, four groups were derived, and the participants were placed in one of the four groups: bipolar, unipolar, disruptive, and no diagnosis. The GBI was administered to the parents and children ten years of age and above. Findling et al. (2002) chose not to administer the GBI to children under ten years of age because such children might not understand the questions being asked.

For adults, the GBI Depressive Symptoms scale resulted in an alpha of 0.97, and for adolescents, the GBI Depressive Symptoms scale alpha was 0.94. For adults, the GBI Hypomanic/Biphasic scale resulted in an alpha of 0.96, and for adolescents, the GBI Hypomanic/Biphasic scale alpha was 0.94. Receiver operating characteristic (ROC) curves were utilized to derive area under the curves (AUCs). The area under the curve is used to determine the probability of the GBI to accurately classify children in their correct diagnostic group. AUC between 0.50 and 0.70 reflects low accuracy, 0.70 – 0.90 reflects medium accuracy, and 0.90-1.00 reflect high accuracy (Metz, 1978). Of the

children who completed the GBI and accompanying parent completed GBI forms, there was significant agreement in the ratings of depressive symptoms and hypomanic symptoms ($r = 0.44$, $p = 0.001$); effect size was not reported. Additionally, the Hypomanic/Biphasic scale was better able to significantly discriminate between bipolar disorder and other disorders. Both parent and adolescent reports had AUCs that fell in the medium accuracy range, .88 and .82, respectively. Findling et al. (2002) suggested cut-off scores based on the data from this study. In order to correct classify 90% of adolescents with bipolar disorder, a cut-off score of 17 or higher would need to be utilized, but this would also lead to about a third of adolescents being incorrectly identified as not having bipolar disorder. A cut-off score of 36 or higher would lead to 90% of adolescents being correctly identified as not having bipolar disorder and correctly identify 60% of adolescents with bipolar disorder. Results from this study suggested that the GBI was an effective instrument to utilize with a younger population and could also be used by parents to report their children's symptoms. Findling et al. (2002) also suggested that because the GBI had greater specificity than sensitivity, the GBI was considered an exceptionally useful instrument in the ruling "out" of bipolar disorder and not simply a screener (Findling et al., 2002).

Reichart et al. (2005) noted that bipolar disorder is more common among individuals that have a parent with bipolar disorder. As with all other psychiatric disorders, early intervention is important in alleviating the severity of symptoms (Reichart et al., 2005). Early intervention becomes difficult with individuals with bipolar disorder because symptoms resemble other disorders, namely ADHD, and are mistaken for and misdiagnosed (Pendergast et al., 2014). Moreover, symptoms of bipolar disorder

typically begin, or in the cases of pediatric bipolar disorder, become more pronounced during puberty, between ages 15-19 (Pendergast et al., 2014; Reichart et al., 2005). Consequently, the early diagnosis and intervention of bipolar disorder becomes increasingly difficult. Reichart et al. (2005) studied the predictive validity of the GBI in adolescents with parents who were diagnosed with bipolar disorder. One hundred and forty individuals between the ages of 11 and 21 participated in the study during the first measurement (T1). Parents diagnosed with bipolar disorder were also being treated in an outpatient facility. Fourteen months later, the second measurement (T2) was taken, and five years later, the third measurement (T3) was taken with 120 participants. The final analyses were conducted on 129 participants who have scores at T1 and T3. The GBI was administered at each measurement time to assess unipolar and bipolar depression. The Kiddie Schedule of Affective Disorders and Schizophrenia Present and Lifetime Version (K-SADS-PL, Kaufman et al., 1997) was also given at T1 and T2 in order to assess for current psychiatric disorders. The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID I, First et al., 1997) was given at T3 in order to assess for current and past psychiatric disorders.

During the first measurement, 45% of adolescents met criteria for a disorder and at the third measurement, 59% of adolescents met criteria for a disorder. Based on the results from the measures at T3, the individuals were placed into one of four groups: bipolar disorder, unipolar mood disorder, non-mood disorder, and no disorder. Results indicated that based on the increase in scores from T1 and T3, researchers were able to differentiate between new bipolar and new unipolar depression ($p = 0.02$) and non-mood disorders, ($p = 0.05$). Researchers were also able to differentiate individuals with new

mood disorders and non-mood disorders ($p = 0.02$) and between individuals with new mood disorders and individuals with no disorders ($p = 0.05$). Reichart et al. (2005) also found that individuals that had an elevated score on the Depression scale were more likely to predict a switch from unipolar depression to bipolar depression, (odds ratio = 1.13, $p = 0.02$). Only the Depression scale was able to predict a switch from unipolar depression to bipolar depression; those, with parents diagnosed with bipolar depression, that switched from unipolar depression to bipolar depression had significantly higher scores during the first measurement. Reichart et al. (2005) suggested that a possible explanation for Depression scales to be more predictive of the development of bipolar disorder as opposed to the Hypomanic/Biphasic Scale, is that in more than 80% of the bipolar individuals, unipolar depression is likely to come before the onset of mania. In summary, the GBI can be used for children that have parents diagnosed with bipolar disorder to assess for elevation on the Depression scale. If Depression scales are elevated, children should be consistently monitored for the possibility of manic symptoms. Nine years later, Pendergast et al., (2014) demonstrated the GBI's ability to distinguish unipolar and bipolar depression as well as ADHD. This indicated that the GBI was an effective instrument to be utilized by clinicians for more accurate diagnosis among children and adolescents.

Conclusion. Early and accurate diagnosis of mental illness is one of the most crucial aspects in combating the debilitating impacts of mental illness. To ensure clinicians are accurately diagnosing individuals, it is vital to use instruments that have demonstrated effectiveness in accurate identification. Furthermore, it is crucial to ensure instruments are accurately measuring symptoms for individuals of all ethnic and racial

backgrounds due to the prior research indicating the discrepancies between identification, diagnosis, and treatment of mental illness. The GBI has demonstrated wide-ranging, thorough psychometric properties in the assessment and diagnosis of mood disorders. The GBI has shown to more accurately identify various disorders, specifically mood disorders, which can be considered the most critical aspect of addressing and treating mental health. In addition to being an effective instrument for children, adolescents, and adults, the GBI has also demonstrated effectiveness with ethnic minority groups (Lee et al., 2015).

The TDI and STICSA were recently developed to assess mood and anxiety disorders, respectfully. The STICSA has demonstrated its effectiveness in distinguishing between somatic and cognitive anxiety and this has proved to be especially useful in informing treatment (Ree et al., 2008). The TDI has shown to be a more unified and accurate instrument in the measurement of depression (Balsamo et al., 2014). Likewise, it has also demonstrated the ability to distinguish the various severity levels of depression and illustrated its use as a screener (Balsamo and Saggino, 2014). While there is promising research validating its use, more research needs to be conducted with more diverse samples to verify that the TDI is an accurate in its use with ethnic minorities. Given the sound psychometric properties of the GBI, the GBI could be considered a useful comparison instrument in the comparison to newer instruments designed to assess mood disorders. Accordingly, the GBI was used as a comparison to assess the effectiveness of the TDI among an ethnic minority sample of individuals.

Research Questions

The following research questions were proposed: 1) Is the TDI a valid measure of

depression in Middle Eastern/Arab Americans? 2) Does the TDI demonstrate convergent and discriminant validity with the GBI and STICSA? Ideally, the TDI Total score should correlate highly with the GBI Depression scale, and conversely, the TDI Total score should have lower correlations with the GBI Hypomanic/Biphasic scale, demonstrating convergent and discriminant validity, respectfully. Additionally, as the STICSA was designed to distinguish depression and anxiety, it was predicted that the STICSA and the TDI would demonstrate discriminant validity. Addressing questions about the psychometric properties of the TDI ensures its utility with ethnically diverse individuals.

Method

Participants

Participation was open to all willing individuals ages 18 to 30. Specifically, the target population was ethnically diverse individuals ages 18 to 30. The initial sample included 132 participants from the general public. Primary focus and comparisons were with Middle Eastern/Arab American and White/Caucasian participants. Therefore, any individuals who did not identify with the target groups, were outside of the age range, and did not reside in the United States were removed from the sample. Further, any participants who did not have complete TDI data was also removed from the final sample, as the psychometric properties of the TDI were the primary focus of this study. This resulted in a final total sample of 56 individuals: 17 Middle Eastern/Arab American (ME/AA) individuals and 39 White/Caucasian (W/C) individuals. Demographic information for the final total sample is presented in Table 1.

Table 1
Demographic Characteristics

Variable	Total (N=56)		Middle Eastern/Arab American (N=17)		White/Caucasian (N=39)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<u>Gender</u>						
Male	4	7.1	28	11.8	2	5.1
Female	52	92.9	15	88.2	37	94.9
Nonbinary	0	0.0	0	0	0	0
Other	0	0.0	0	0	0	0
<u>Sexual Orientation</u>						
Homosexual	1	1.8	1	5.9	0	0
Heterosexual	53	94.6	16	94.1	37	94.9
Bisexual	2	3.6	0	0	2	5.1
Pansexual	0	0.0	0	0	0	0
Queer/Other	0	0.0	0	0	0	0
<u>Race/Ethnicity</u>						
Middle Eastern/Arab American	17	30.4	17	30.4	0	0
White/Caucasian	39	69.6	0	0	39	69.6
<u>Formal Diagnosis</u>						
Depression	2	3.6	1	5.9	1	2.6
Anxiety	8	14.3	3	17.6	5	12.8
Depression & Anxiety	9	16.1	2	11.8	7	17.9
Bipolar Disorder	3	5.4	0	0	3	7.7
Other/Multiple	3	5.4	2	11.8	1	2.6
None	31	55.4	9	52.9	22	56.4

Instruments

Teate Depression Inventory. The TDI (Balsamo & Saggino, 2013) is a 21-item, self-report measure for depressive symptoms, originally developed in Italy. Items are reported on a 5-point ordinal scale (0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Always). Prior research has demonstrated acceptable reliability and validity of TDI scores (Balsamo et al., 2014; Balsamo & Saggino, 2014). Four scores were calculated for data analyses: TDI Total (sum of all 21 items), Depressed Mood, Life Satisfaction, and

Daily Function. The English translated version of the TDI (Ruan et al., 2016) was used.

State-Trait Inventory for Cognitive and Somatic Anxiety. The STICSA (Ree, MacLeod, French, & Locke, 2000) is a 42-item, self-report measure for symptoms of anxiety. The STICSA consists of two scales. The Trait Scale includes 21 items that measure general levels of cognitive and somatic symptoms on 4-point ordinal scale (1 = Almost Never, 2 = Occasionally, 3 = Often, 4 = Almost Always). The State Scale is similar to the Trait Scale, however, it measures anxiety at a given time. Four scores were calculated for data analyses: Trait-Cognitive, Trait-Somatic, State-Cognitive, and State-Somatic.

General Behavior Inventory. The GBI (Depue, 1987) is a 73 item, self-report measure of mood disorders. The GBI includes 46 items that measure depressive symptoms and 28 items that measure hypomanic/biphasic symptoms on a 4 point ordinal scale (0 = Never or Hardly Ever, 1 = Sometimes, 2 = Often, 3 = Very Often/Almost Constantly). Two scores were calculated for data analyses: Depression and Hypomanic/Biphasic.

Procedure

Eastern Illinois University Institutional Review Board approval, 17-040, was obtained and reported a minimal risk to participants. A letter of invitation (Appendix A) and an anonymous link was sent out via social media platforms and email and shared electronically to participants across the United States. The link was shared with Eastern Illinois University students and student organizations, students at various campuses, individuals not currently attending school, professional organizations, and various other

individuals. Appendix B presents a complete list of agencies, organizations, and social media platforms where the link was sent.

Demographic information was collected from all participants including age, gender/sex, race/ethnicity, marital status, education level, formal diagnoses, zip code, and religious affiliations. Participants were asked to provide informed consent. After consent was obtained, participants were directed to the first randomly selected instrument. All participants were administered the Teate Depression Inventory (TDI; Balsamo & Saggino, 2013), State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, MacLeod, French, & Locke, 2000), and the General Behavior Inventory (GBI; Depue, 1987), however, participants were presented the instruments in a random counterbalanced order.

Data Analysis

SPSS Version 24 was used to estimate Pearson product-moment correlations for convergent and discriminant validity coefficients. As mentioned earlier, it was expected that the TDI and GBI Depression scale would produce high positive correlations, demonstrating convergent validity, while the TDI and GBI Hypomanic/Biphasic Scale would produce lower correlations, demonstrating discriminant validity. It was also expected that the TDI and STICSA would produce lower correlations, demonstrating discriminant validity. Dependent *t*-tests for differences between correlations were calculated to compare convergent and discriminant validity coefficients using SimpleStats Test program (Watkins, 2007) for the total sample and ME/AA and W/C samples. Lastly, *z*-tests for independent correlations were calculated with SimpleStats Test program (Watkins, 2007) to compare differences in coefficients between the Middle

Eastern/Arab Americans and White/Caucasian individuals.

Results

Individuals who did not have complete TDI data ($N = 132$), were removed from the sample as the TDI was the focus of the study. The final sample included 56 individuals, 17 Middle Eastern/Arab American and 39 were White/Caucasian. Due to measures being administered in counter-balanced order, the sample size varied for each measure as some participants did not complete all scales. Each participant was required to have complete TDI data, therefore, all 56 individuals completed the TDI; however, of the 56 individuals, 51 completed the STICSA and 44 completed the GBI.

Descriptive Statistics.

Descriptive statistics (means, standard deviations, range, skewness, and kurtosis) for the TDI, STICSA, and GBI, for the total sample, are presented in Table 2, and descriptive statistics by race/ethnicity are presented in Table 3. TDI included four scores: Total, Depressed Mood, Life Satisfaction, and Daily Function with means ranging from 5.20 – 31.21 for the total sample, 5.65 – 33.82 for ME/AA participants, and 5.00 – 30.08 for W/C participants. The STICSA also included four scores: Trait Cognitive, Trait Somatic, State Cognitive, and State Somatic with means ranging from 14.35 – 21.61 for the total sample, 16.33 – 23.53 for ME/AA participants, and 13.53 – 20.81 for W/C participants. The GBI included two scores: Depression and Hypomanic/Biphasic with means of 37.89 and 17.18 for the total sample, 39.71 and 16.00 for ME/AA participants, and 37.03 and 17.73 for W/C participants. An adjusted probability for independent samples t-tests for mean differences between ME/AA and W/C groups for all ten comparisons of 0.005 was determined to be significant ($p < .05/10 = 0.005$). No

significant differences were found between ME/AA and W/C participants on any TDI, STICSA, or GBI scores. Please refer to Table 2 and 3 for complete descriptive statistics.

Table 2

Descriptive Statistics for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory for Total Sample (N = 56)

Variable	<i>M</i>	<i>SD</i>	Range	Skewness	Kurtosis
<u>TDI</u>					
Total	31.21	15.01	7-62	0.42	-0.92
Depressed Mood	16.89	9.18	4-36	0.42	-0.92
Life Satisfaction	9.13	5.20	1-20	0.39	-0.95
Daily Function	5.20	2.11	2-9	-0.76	-0.76
<u>STICSA</u>					
Trait Cognitive	21.61	7.43	12-39	0.67	-0.36
Trait-Somatic	18.02	5.37	12-34	1.14	0.89
State-Cognitive	16.75	6.96	10-35	1.01	0.07
State-Somatic	14.35	4.57	11-33	2.27	5.84
<u>GBI</u>					
Depression	37.89	29.09	2-112	0.93	0.07
Hypomania/Biphasic	17.18	14.21	1-56	1.60	3.60

Note. TDI sample $n = 56$, STICSA sample $n = 51$ as 5 participants failed to complete the STICSA, GBI sample $n = 44$ as 12 participants failed to complete the GBI.

Based on previous research, the TDI Total means obtained from the total sample, ME/AA participants, and W/C participants are similar to means obtained by a mildly depressed diagnostic group (Balsamo & Saggino, 2014). Means obtained from STICSA Trait Cognitive, Trait Somatic, State Cognitive, and State Somatic for the total sample are similar to previous means obtained by non-clinical comparison groups (Grod et al. 2007). Middle/Eastern/Arab American participants demonstrated similar means to non-clinical comparison groups for all scales except Trait Somatic, which was more similar to means obtained by individuals with diagnosed anxiety disorders. This comparison is reflective of previous research that indicates ethnic minority groups tend to report physical symptoms rather than cognitive symptoms (Lancaster et al. 2015). White/Caucasian participants demonstrated similar means to non-clinical comparison groups for Trait

Cognitive and Trait Somatic; however, it was noted that W/C demonstrated lower means for State Cognitive and State Somatic when compared with a non-clinical comparison group.

Table 3
Descriptive Statistics for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory

Variable	<i>M</i>	<i>SD</i>	Range	Skewness	Kurtosis
Middle-Eastern (<i>n</i> = 17)					
<u>TDI</u>					
Total	33.82	18.16	7-62	0.34	-1.45
Depressed Mood	18.59	10.95	4-36	0.33	-1.43
Life Satisfaction	9.59	6.23	1-20	0.33	-1.31
Daily Function	5.65	2.26	2-9	-0.13	-1.05
<u>STICSA</u>					
Trait Cognitive	23.53	9.72	12-39	0.35	-1.63
Trait-Somatic	20.80	7.29	12-34	0.50	-1.12
State-Cognitive	19.13	9.56	10-35	0.63	-1.4
State-Somatic	16.33	6.53	11-33	1.51	2.03
<u>GBI</u>					
Depression	39.71	35.23	2-112	0.83	-0.35
Hypomania/Biphasic	16.00	16.02	1-56	1.30	1.53
White/Caucasian (<i>n</i> = 39)					
<u>TDI</u>					
Total	30.08	13.52	7-61	0.34	-0.89
Depressed Mood	16.15	8.35	2-34	0.35	-0.86
Life Satisfaction	8.92	4.72	2-18	0.36	-0.93
Daily Function	5.00	2.04	1-9	-0.12	-0.62
<u>STICSA</u>					
Trait Cognitive	20.81	6.24	10-36	0.61	0.31
Trait-Somatic	16.86	3.89	11-27	0.76	0.05
State-Cognitive	15.75	5.40	10-27	0.67	-0.81
State-Somatic	13.53	3.22	11-26	2.28	6.33
<u>GBI</u>					
Depression	37.03	26.38	4-106	1.00	0.38
Hypomania/Biphasic	17.73	13.54	1-68	1.97	6.09

Note. Middle Eastern/Arab Americans = TDI sample *n* = 17, STICSA = sample *n* = 15 as 2 participants failed to complete the STICSA, GBI = sample *n* = 14 as 3 participants failed to complete the GBI. White/Caucasian = TDI sample *n* = 39, STICSA sample *n* = 36 as 3 participants failed to complete the STICSA, GBI sample *n* = 30 as 9 participants failed to complete the GBI. Independent samples t-tests found no significant differences between ME/SS and W/C samples on TDI, STICSA, or GBI scores *p* < .008 (Bonferroni adjusted *p* < .05).

Table 4

Construct validity coefficients for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory for Total Sample (n = 56)

	Teate Depression Inventory (TDI)			
	Total	DM	LS	DF
State-Trait Inventory for Cognitive and Somatic Anxiety				
Trait Cognitive	.78^D	.79^D	.62^D	.58^D
Trait Somatic	.71^D	.74^D	.53^D	.51^D
State Cognitive	.76^D	.76^D	.63^D	.55^D
State Somatic	.53^D	.53^D	.41^D	.46^D
General Behavior Inventory				
Depression	.82^C	.87^C	.63^C	.52^C
Hypomania/Biphasic	.57^D	.66^D	.35^D	.30^D

Note. TDI sample $n = 56$, STICSA = sample $n = 51$ as 5 participants failed to complete the STICSA, GBI = sample $n = 44$ as 12 participants failed to complete the GBI. Convergent Validity Coefficient^C and Discriminant Validity Coefficient^D.

Convergent Validity

Convergent and discriminant validity coefficients for the total sample are presented in Table 4. Convergent and discriminant validity coefficients for Middle Eastern/Arab Americans and White/Caucasians Americans are presented in Table 5 where Middle Eastern/Arab American coefficients are below the diagonal and White/Caucasian Americans are above the diagonal. All validity coefficients presented in bold print were statistically significant ($p < .05$). Please refer to Appendix C for a complete correlation matrix.

Total Sample. Convergent validity coefficients for the total sample (see Table 4) TDI Total, Depressed Mood, Life Satisfaction, and Daily Function scores and GBI Depression score ranged from .52 to .87, which were larger than the discriminant validity coefficients between all four TDI scores and GBI Hypomanic/Biphasic scores that ranged from .30 to .66. This comparison was expected as convergent validity coefficients should be larger than discriminant validity coefficients.

Table 5

Construct validity coefficients for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory for Middle Eastern/Arab American Participants (n = 17) and White/Caucasian Participants (n = 39)

	Teate Depression Inventory (TDI)			
	Total	DM	LS	DF
Middle Eastern/Arab American (n = 17)				
State-Trait Inventory for Cognitive and Somatic Anxiety				
Trait Cognitive	.78 ^D	.79 ^D	.62 ^D	.58 ^D
Trait Somatic	.71 ^D	.74 ^D	.53 ^D	.51 ^D
State Cognitive	.76 ^D	.76 ^D	.63 ^D	.55 ^D
State Somatic	.53 ^D	.53 ^D	.41 ^D	.46 ^D
General Behavior Inventory				
Depression	.82 ^C	.87 ^C	.63 ^C	.52 ^C
Hypomania/Biphasic	.57 ^D	.66 ^D	.35 ^D	.30 ^D
White/Caucasian (n = 39)				
State-Trait Inventory for Cognitive and Somatic Anxiety				
Trait Cognitive	.78 ^D	.79 ^D	.62 ^D	.58 ^D
Trait Somatic	.71 ^D	.74 ^D	.53 ^D	.51 ^D
State Cognitive	.76 ^D	.76 ^D	.63 ^D	.55 ^D
State Somatic	.53 ^D	.53 ^D	.41 ^D	.46 ^D
General Behavior Inventory				
Depression	.82 ^C	.87 ^C	.63 ^C	.52 ^C
Hypomania/Biphasic	.57 ^D	.66 ^D	.35 ^D	.30 ^D

Note. Middle Eastern/Arab American Participants (n = 17) coefficients below the diagonal and White/Caucasian Participants (n = 39) coefficients above the diagonal. Middle Eastern/Arab Americans = TDI sample n = 17, STICSA = sample n = 15 as 2 participants failed to complete the STICSA, GBI = sample n = 14 as 3 participants failed to complete the GBI. White/Caucasian = TDI sample n = 39, STICSA sample n = 36 as 3 participants failed to complete the STICSA, GBI sample n = 30 as 9 participants failed to complete the GBI. Convergent Validity Coefficient^C and Discriminant Validity Coefficient^D.

Middle Eastern/Arab Americans. Convergent validity coefficients for Middle Eastern/Arab Americans (see Table 5) TDI Total, Depressed Mood, Life Satisfaction, and Daily Function scores and GBI Depression ranged from .57 to .89. These convergent validity coefficients were also larger than the discriminant validity coefficients between all four TDI scores and GBI Hypomanic/Biphasic scores, which ranged from .24 to .70.

White/Caucasian Americans. Convergent validity coefficients for White/Caucasian Americans (see Table 5) TDI Total, Depressed Mood, Life Satisfaction, and Daily Function scores and GBI Depression ranged from .37 to .86.

Discriminant Validity

Total Sample. Discriminant validity coefficients for the total sample (see Table 4) TDI Total Score, Depressed Mood, Life Satisfaction, and Daily function and STICSA Trait Cognitive, Trait Somatic, State Cognitive and State Somatic scores ranged from .41 to .79, while discriminant validity coefficients between TDI Total Score, Depressed Mood, Life Satisfaction, and Daily function and GBI Hypomanic/Biphasic scores ranged from .30 to .66, which were lower when compared to convergent validity coefficients between the TDI scores and GBI Depression.

Middle Eastern/Arab Americans. Discriminant validity coefficients for Middle Eastern/Arab Americans (see Table 5) TDI Total Score, Depressed Mood, Life Satisfaction, and Daily function and STICSA Trait Cognitive, Trait Somatic, State Cognitive and State Somatic ranged from .51 to .91. Discriminant validity coefficients between TDI Total Score, Depressed Mood, Life Satisfaction, and Daily function and GBI Hypomanic/Biphasic scores ranged from .25 to .70. These coefficients were also found to be lower than convergent validity coefficients between TDI scores and GBI Depression.

White/Caucasian Americans. For White/Caucasian participants, discriminant validity coefficients (see Table 5) for TDI Total Score, Depressed Mood, Life Satisfaction, and Daily function and STICSA Trait Cognitive, Trait Somatic, State Cognitive and State Somatic ranged from .31 to .68. Discriminant validity coefficients

between TDI scores and GBI Hypomanic/Biphasic scores ranged from .10 to .63. Like the total sample and ME/AA participants, discriminant validity coefficients between TDI scores and GBI Hypomanic/Biphasic were also lower than the convergent validity coefficients between TDI scores and GBI Depression for W/C participants.

Between Group Comparisons

Z-tests for independent correlations were calculated using SimpleStats Tests (Watkins, 2007) to compare Middle Eastern/Arab Americans' correlations and White/Caucasian Americans' correlations and presented in Table 6. As multiple comparisons were conducted, a Bonferroni correction was used to control for type 1 error of multiple statistical tests. The probability was adjusted for all six comparisons to probability of < 0.008 for statistical significance ($p < .05/6 = 0.008$). No significant differences were found between correlations obtained by ME/AA and W/C samples. Comparisons between TDI scores and GBI scores for the total sample were calculated and presented in Table 7. The probability was adjusted for four comparisons for statistical significance, $p < 0.0125$ ($p < 0.5/4 = 0.0125$), and no significant differences were found between TDI scores and GBI scores for the total sample.

Table 6
Between Group Comparison of Correlation Coefficients for Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory (N = 56)

Comparison	Race/Ethnicity		<i>z</i>	<i>p</i>
	ME/AA	W/C		
<u>Convergent</u>				
TDI Total and GBI Depression	.84	.81	0.263	.7924
<u>Discriminant</u>				
TDI Total and GBI Hypomanic/Biphasic	.60	.54	0.249	.8035
TDI Total and STICSA Trait Somatic	.84	.62	1.472	.1411
TDI Total and STICSA Trait Cognitive	.90	.68	1.908	.0564
TDI Total and STICSA State Somatic	.69	.36	1.397	.1623
TDI Total and STICSA State Cognitive	.90	.64	2.118	.0342

Note. Middle Eastern/Arab Americans = TDI sample $n = 17$, STICSA = sample $n = 15$ as 2 participants failed to complete the STICSA, GBI = sample $n = 14$ as 3 participants failed to complete the GBI. White/Caucasian = TDI sample $n = 39$, STICSA sample $n = 36$ as 3 participants failed to complete the STICSA, GBI sample $n = 30$ as 9 participants failed to complete the GBI. ME/AA = Middle Eastern/Arab American; W/C = White/Caucasian.

Table 7
Between Group Comparison of Convergent Validity and Discriminant Validity Coefficients (N = 56)

Comparison	<i>z</i>	<i>p</i>
TDI Total/GBI Depression (C) and TDI Total/GBI Hypomanic/Biphasic (D)	2.367	.0179
TDI Depressed Mood/GBI Depression (C) and TDI Depressed Mood/GBI Hypomanic/Biphasic (D)	2.425	.0153
TDI Life Satisfaction/GBI Depression (C) and TDI Life Satisfaction/GBI Hypomanic/Biphasic (D)	1.713	.0868
TDI Daily Function/GBI Depression (C) and TDI Daily Function /GBI Hypomanic/Biphasic (D)	1.187	.2353

Note. GBI sample $n = 44$, as 12 participants failed to complete the GBI.

Discussion

The present study aimed to explore the construct validity of the Teate Depression Inventory with a Middle Eastern/Arab American sample. Ethnic minority individuals are at an increased risk for mental illness, and a disparity in mental health treatment and research in ethnic minority populations has long been documented (Amer & Hovey, 2013; Anglin et al., 2010; Padela & Heisler, 2010).

For many reasons including, but not limited to, cultural stigma, lack of trust in mental health professionals, and inequality of care, ethnic minority individuals are less likely to seek mental health treatment (Anglin et al., 2008; Waheed et al., 2015). Previous research has suggested that Middle Eastern individuals may be less likely to seek treatment for mental health concerns due to a general negative stigma associated with mental health, or the belief that spirituality will better their mental health (Dotigna, 2017). Many of the current assessment tools used within the mental health field were developed and researched on the majority population, White/Caucasian individuals. Therefore, very little is known about test utility with ethnic minority individuals, suggesting that accurate diagnosis and treatment may be compromised. One way to overcome disparities in diagnosis and treatment of mental health is to ensure the tools utilized are valid measures for use with ethnic minority individuals.

As noted by Balsamo and Saggino (2013), the TDI was developed with the intention to be a purer measure of depression by only focusing on cognitive symptoms rather than somatic symptoms. Similarly, the STICSA was developed to better differentiate between trait and state anxiety and cognitive and somatic anxiety. Research has been conducted on both the TDI and the STICSA and supports overall psychometric

properties. However, very little research has been conducted on the use of the TDI and STICSA with ethnic minority groups. Therefore, in an effort to ensure valid measurement tools are utilized with ethnic minority individuals, the present study explored the construct validity of a newer depression inventory, that previous research has demonstrated strong psychometric support for (Balsamo et al., 2014; Balsamo and Saggino, 2014; Rushworth, 2016), with an ethnically diverse population. Specifically, convergent and discriminant validity coefficients between the TDI and State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, MacLeod, French, & Locke, 2008) and General Behavior Inventory (GBI; Depue, 1987) were calculated to determine if the TDI is a strong measure of depression symptoms in Middle Eastern/Arab American sample and if it demonstrated strong psychometric properties.

The TDI was developed to be a purer measure of depression (Balsamo and Saggino, 2014), while the STICSA was developed to be a more accurate measure of anxiety, a similar, but nonetheless, different construct than depression. Therefore, since the TDI and STICSA purportedly measure two separate constructs, ideally, they would have lower coefficients, demonstrating discriminant validity for all participants regardless of race. Comparisons between the TDI and GBI were conducted as the GBI has demonstrated sound psychometric properties in accurately identifying depression and differentiating between depression and bipolar disorder (Barr et al., 1992; Depue, 1987; Findling et al., 2002; Wold, 1990).

Participation was open to all adults ages 18-30 residing in the United States. Participants provided consent, demographic information was collected, and participants then completed the TDI, STICSA, and GBI in random-counterbalanced order through an

online link that was shared via social media platforms to local, state, and national organizations and universities. As primary focus was placed on the TDI, participants with incomplete TDI data were removed from the total sample, resulting in 56 participants. Pearson product-moment correlations for convergent and discriminant validity coefficients were calculated, followed by dependent *t*-test for difference between correlations, and lastly, *z*-tests for independent correlations were calculated to compare differences between convergent and discriminant validity coefficients.

Like many previous research studies that demonstrated strong psychometric property for the TDI (Balsamo et al., 2014; Balsamo and Saggino, 2014; Rushworth, 2016), results from the present study suggested overall strong convergent and discriminant validity of the TDI with the GBI and STICSA, respectively, with use on an ethnically diverse sample. However, while much of the previous research on the TDI, except for research conducted by Rushworth (2016), the TDI has mostly been studied with majority ethnic populations (White/Caucasian). Rushworth (2016) examined the construct validity of the TDI with a Black/African American sample and found overall strong support for the TDI's construct validity. Convergent validity correlations between the TDI and GBI Depression scales for ME/AA ($r = .84$) and W/C ($r = .81$) participants found in the current study were much like convergent validity coefficients found by Rushworth (2016) between TDI and GBI Depression for Black/African American ($r = .82$) and W/C participants ($r = .76$). Discriminant validity coefficients between TDI and GBI Hypomanic/Biphasic scale, for the total sample, ME/AA participants, and W/C participants were smaller than convergent validity coefficients between TDI and Depression scales, similar to results found by Rushworth (2016). In contrast to

Rushworth (2016), where validity coefficients between TDI and STICSA Trait and State Somatic scales, $r = .49$ and $r = .51$ for Black/African American participants, respectively, were lower than TDI and STICSA Trait and State Cognitive scales, results from the current study found similar validity coefficients across all STICSA scales ranging from .69 - .90 for ME/AA participants and .36 - .68 for W/C participants. Discriminant validity coefficients between TDI scores and STICSA scores for ME/AA appeared larger than for W/C participants by visual inspection of Table 5, though these differences were not statistically significant and may be impacted by the small sample size. Thus, no significant differences were found between ME/AA and W/C participants, indicating that the TDI appeared to measure depression symptoms in ME/AA individuals similar to W/C participants.

Limitations

The target population for this study was Middle Eastern/Arab Americans. While several means to obtain participants were utilized, there were many fewer ethnic minority individuals who participated in the study when compared to White/Caucasian individuals. A lack of Middle Eastern/Arab American participation resulted in a reduced sample and reduced power. Previous research has suggested that Middle Eastern/Arab Americans may be less trusting in reporting concerns related to mental health in fear that it may be used against them (Amer & Hovey, 2013). Given changes in the recent political climate and increased open hostility towards ethnically diverse individuals, fears and lack of trust in online participation regarding mental health concerns may have also impacted participation as well.

As noted by Dotinga (2017), Arab Americans seeking treatment in a large

metropolitan area were less likely to complete a depression inventory. This alone causes may concerns when attempting to diagnose and treat mental health illnesses. Dotinga (2017) also stated that the reluctance in mental health treatment may be due in part because Arab Americans may believe their “mental health condition is the will of God.” Religion within the Middle Eastern culture impacts every aspect of an individual’s life and may perpetuate the stigma around mental health. It is likely that this may have also impacted the number of participants and the response style.

As mentioned earlier, each measure was a self-reported scale, therefore, several limitations should be considered. Like all self-reports, biases may have impacted the way participants responded to the measures, where some participants may have under- or over- reported their symptoms. Further, as participation was anonymous and measures were completed remotely, honesty and accuracy of reporting of demographic information, diagnoses, or symptoms could not be confirmed. Sampling bias may have also impacted participation in the study. As participation was entirely voluntary, the participants who completed the measures may not be a true representation of the entire target population.

Further, information regarding whether an individual was born in the United States or immigrated at a later time was not collected in addition to reasons for immigrating to the United States, and country of origin was not collected. While current location of residency, zip code, was collected, it was not used in the data analysis. Such variables can greatly impact and individual’s view on mental health, participating in mental health research, and reporting mental health symptoms.

Future Direction

It is imperative for data collection to continue in order to obtain a larger sample size. A larger sample size would allow for a more representative sample of the target and comparison populations, greater power, and the ability to further analyze data. Race and ethnicity greatly shape mental health, and it is well known that racial and ethnic minority groups are at an increased risk for mental health concerns (Waheed et al., 2015). It is also well known that socioeconomic status (SES) impacts mental health where lowered SES highly correlates with greater mental health concerns (D'Anna et al., 2010). However, most individuals do not identify with one identity, but rather have intersectional identities (i.e., a low SES individual who is also identifies as a minority and is part of the LGBTQ+ community). Continued research and further analysis of data is needed to ensure its utility with intersectional individuals.

While many Middle/Eastern individuals choose to immigrate and reside in the United States, often many other Middle Eastern individuals immigrate to other countries where views on mental health may differ dramatically. Future research should gather data on participants' world-view for more comprehensive results. Similarly, future research should gather data regarding where in the Middle East individuals were originally from. For example, Egyptian Middle Eastern individuals may greatly differ from Saudi Arabian Middle Eastern individuals. Lastly, the reasons for immigration could greatly impact results of future studies. Refugee individuals will likely respond to rating scales of this nature very differently than those that immigrated to the United States for other reasons such as education or work. Information of this nature may be incredibly useful in future data gathering and analysis.

Conclusion

Results from the present study suggested overall strong convergent and discriminant validity of the TDI with use on ME/AA individuals. As depression and anxiety are two separate constructs, it was predicted that the TDI and STICSA would produce lower, discriminant validity coefficients. Similarly, it was predicted that the TDI and GBI Hypomanic/Biphasic scale would also produce lower, discriminant validity coefficients as they are designed to measure two separate constructs. Similarly, it was predicted that the TDI and GBI Depression would produce higher validity coefficients, demonstrating convergent validity. These predictions were supported based on current results. No significant differences were found between validity coefficients of ME/AA and W/C participants. The present study has further demonstrated the need for more research on mental health measures for ethnically diverse individuals to ensure scores from measures are valid and reliable. While there were limitations such as sample size and representativeness, the current research has provided foundational groundwork for further research of this nature. Further data collection and analyses are required to improve the power of the study and continue to provide valuable information regarding the psychometric properties of assessments used to diagnosis mental illness and inform treatment.

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Appendix A

Invitation to Participate/Informed Consent

I am a School Psychology graduate student and conducting research to identify how three different questionnaires that measure symptoms or characteristics of mood and worry compare. In the mental health field, it is essential that valid and reliable tools are used to provide the best services to those in need and your responses to these questions based on your experiences is helpful.

My first task and first goal is to gather more information about how several newer questionnaires work in measuring individual's reports of fear, worry, and various moods. Participation in the study is anonymous and will be extremely beneficial to building a better understanding of how well these newer questionnaires work. All information will be confidential, but some of the items or questions could make some individuals feel uncomfortable. In the event that participants feel concerned about mental health, contact information for national mental health organizations will be provided at the end of the survey. Although there are not direct benefits to the participants, individuals may gain insight about mental health through completing the survey and help contribute valuable information to the mental health field. Completing the surveys may take between 20 and 45 minutes. Participation in the study is voluntary, however individuals who participate will have the opportunity to win a \$50 Amazon gift card upon completing the survey. If you have any questions, please contact the primary investigator, Dalia Bunni at dmbunni@eiu.edu or the faculty sponsor, Dr. Gary Canivez at gcanivez@eiu.edu.

If you have any questions or concerns about the treatment of human participants in this study, you may call or write: Institutional Review Board, Eastern Illinois University, 600 Lincoln Ave., Charleston, IL 61920, Telephone: (217) 581-8576, E-mail: eiuirb@www.eiu.edu

You will be given the opportunity to discuss any questions about your rights as a research subject with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with EIU. The IRB has reviewed and approved this study.

Demographic Information

Age:

Sex:

Race/Ethnicity: White/Caucasian, Black/African American, Asian American, Hispanic/Latino American, Native American Indian, Other

Highest Level of Education: Some High School, High School Diploma, GED, Some College, Bachelor's Degree or higher

Sexual Orientation: Homosexual, Heterosexual, Bisexual

Religious Affiliation: Christian, Jewish, Muslim, Hindu, Buddhist, Agnostic, Atheist, Other

Marital Status: Single, Married, Divorced

Formal Mental Health Diagnosis: Anxiety, Depression, Bipolar Disorder, Other

Zip Code

Teate Depression Inventory

State-Trait Inventory for Cognitive and Somatic Anxiety

General Behavior Inventory

Final Page

If you are looking for more information regarding mental health, please contact a national organization.

National Institute of Mental Health

Website: <https://www.nimh.nih.gov/index.shtml>

Health and Information: <https://www.nimh.nih.gov/health/index.shtml>

Telephone: 1-866-615-6464 (toll-free)

Monday through Friday

8:30 a.m. to 5:00 p.m. ET

Email: nimhinfo@nih.gov

Anxiety and Depression Association of America

Understanding Anxiety: <https://www.adaa.org/understanding-anxiety>

Finding Help: <https://www.adaa.org/finding-help>

Contact Information: <https://www.adaa.org/contact-adaa>

Telephone: 240-485-1001

Email: information@adaa.org

National Alliance on Mental Health

Website: <http://www.nami.org/>

Finding Support: <http://www.nami.org/Find-Support>

Helpline: 800-950-6264

Depression and Bipolar Support Alliance

Website: <http://www.dbsalliance.org/site/PageServer?pagename=home>

Education: http://www.dbsalliance.org/site/PageServer?pagename=education_landing

Toll-free Phone: (800) 826-3632

National Suicide Prevention Line

1-800-273-8255

24 hours, 7 days a week

If you are looking for mental health services, please contact mental health counselors in your community or college campus.

Appendix B**Social Media Platforms**

1. Facebook
2. Twitter
3. Email

Organizations

1. University of Michigan – Dearborn; Research Department
2. Henry Ford Community College; Research Department
3. ACCESS Community
4. Arab America
5. Loyola University - Chicago; Research Department
6. University of Illinois - Chicago; Research Department
7. Arab American Institute
8. Michigan State University; Research Department
9. Central Michigan University; Research Department
10. Wayne State University; Research Department
11. University of Washington - Tacoma; Research Department & Muslim Student Association
12. Swarthmore College; Research Department
13. Cuny - City College; Research Department
14. University of Houston; Arab Student Union
15. University of Vermont; Muslim Student Association
16. California State University; Muslim Student Association
17. University of Maryland; Arab Student Union

18. National Network for Arab American Communities
19. Network of Arab American Professionals
20. Binghamton University; Research Department
21. Arab American Association of New York
22. Middle Eastern Studies Association
23. American Arab Anti-Discrimination Committee (ADC)
24. Chicago Association of Arab American Journalist's and Communicators
25. Arab American Association of Engineers & Architects
26. Jordanian Arab American Business Association
27. Arab American Action Network
28. Arab Chicago
29. The Middle Eastern Feminist
30. Arab American Institute
31. The Arab American News
32. Middle Eastern and Northern African Psychology Association

Appendix C

Table C.1

Construct validity coefficients for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory for Total Sample (n = 56)

Variable	TDI					STICSA			GBI	
	Total	DM	LS	DF	TC	TS	SC	SS	D	H/B
TDI-Total	-	-	-	-	-	-	-	-	-	-
TDI-Depressed Mood	.96	-	-	-	-	-	-	-	-	-
TDI-Life Satisfaction	.88	.74	-	-	-	-	-	-	-	-
TDI-Daily Function	.76	.67	.60	-	-	-	-	-	-	-
STICSA-Trait Cognitive	.78^D	.79^D	.62^D	.58^D	-	-	-	-	-	-
STICSA-Trait Somatic	.71^D	.74^D	.53^D	.51^D	.72	-	-	-	-	-
STICSA-State Cognitive	.76^D	.76^D	.63^D	.55^D	.84	.80	-	-	-	-
STICSA-State Somatic	.53^D	.53^D	.41^D	.46^D	.55	.81	.72	-	-	-
GBI-Depression	.82^C	.87^C	.63^C	.52^C	.85	.70	.69	.48	-	-
GBI-Hypomania/Biphasic	.57^D	.66^D	.35^D	.30^D	.68	.54	.44	.33	.80	-

Note. TDI sample $n = 56$, STICSA = sample $n = 51$ as 5 participants failed to complete the STICSA, GBI = sample $n = 44$ as 12 participants failed to complete the GBI. Convergent Validity Coefficient^C and Discriminant Validity Coefficient^D.

Table C.2

Construct validity coefficients for the Teate Depression Inventory, State-Trait Inventory for Cognitive and Somatic Anxiety, and General Behavior Inventory for Middle Eastern/Arab American Participants (n = 17) and White/Caucasian Participants (n = 39)

Variable	Total	TDI				STICSA				GBI	
		DM	LS	DF	TC	TS	SC	SS	D	H/B	
TDI-Total	-	.95	.87	.73	.68 ^D	.62 ^D	.64 ^D	.36 ^D	.81 ^C	.54 ^D	
TDI-Depressed Mood	.97	-	.70	.59	.71 ^D	.64 ^D	.64 ^D	.32 ^D	.86 ^C	.63 ^D	
TDI-Life Satisfaction	.90	.79	-	.60	.52 ^D	.46 ^D	.51 ^D	.31 ^D	.68 ^C	.42 ^D	
TDI-Daily Function	.81	.78	.61	-	.41 ^D	.36 ^D	.40 ^D	.35 ^D	.37 ^C	.10 ^D	
STICSA-Trait Cog	.90 ^D	.89 ^D	.73 ^D	.84 ^D	-	.53	.71	.23	.77	.67	
STICSA-Trait Som	.84 ^D	.89 ^D	.62 ^D	.74 ^D	.87	-	.62	.67	.55	.46	
STICSA-State Cog	.90 ^D	.91 ^D	.75 ^D	.76 ^D	.92	.91	-	.51	.45	.27	
STICSA-State Som	.69 ^D	.73 ^D	.51 ^D	.63 ^D	.77	.86	.85	-	.20	.14	
GBI-Depression	.84 ^C	.89 ^C	.57 ^C	.78 ^C	.94	.87	.93	.76	-	.76	
GBI-Hypomania/Biphasic	.60 ^D	.70 ^D	.25 ^D	.69 ^D	.72	.71	.67	.59	.87	-	

Note. Middle Eastern/Arab American Participants (n = 17) coefficients below the diagonal and White/Caucasian Participants (n = 39) coefficients above the diagonal. Middle Eastern/Arab Americans = TDI sample n = 17, STICSA = sample n = 15 as 2 participants failed to complete the STICSA, GBI = sample n = 14 as 3 participants failed to complete the GBI. White/Caucasian = TDI sample n = 39, STICSA sample n = 36 as 3 participants failed to complete the STICSA, GBI sample n = 30 as 9 participants failed to complete the GBI. Convergent Validity Coefficient^C and Discriminant Validity Coefficient^D.