A COMPARISON OF ONE, TWO AND THREE-FACTOR MODELS OF DEPRESSION AND ANXIETY IN A COMMUNITY-BASED SAMPLE OF AFRICAN AMERICANS: UNDERSTANDING STRUCTURAL MODELS AND THE IMPACT OF RACIAL DISCRIMINATION ON SYMPTOMS

by

TEMILOLA SALAMI

(Under the Direction of Steven Beach)

ABSTRACT

Given the frequent co-occurrence of symptoms of depression and anxiety, their debilitating course, problems with differential diagnosis, and related problems with accurate diagnosis in African Americans, additional work is required to examine the adequacy of current models of co-morbidity and classification for African Americans. Given the importance of race-related stressors for the well-being of many African Americans, it is also important to examine the impact of race-related stressors on the occurrence and co-occurrence of anxious and depressive symptoms among African Americans. Examination of the differential association of symptom clusters with race-related stressors will provide potential insights about the utility of different facets of structural models of anxiety and depression in capturing response to salient environmental causes. Our sample consisted of 245 African American adults between the ages of 18 and 60-years-old from low-income communities. Participants completed a demographics form, a self-report measure of race-related stress, and self-report measures of depressive and anxious symptoms. Results of the study indicated that a modified two-factor solution using the
Beck Depression Inventory-II and Beck Anxiety Inventory to assess symptoms of depression and anxiety showed better fit to the data than a one (i.e., general distress) or a three (i.e., tripartite) factor model. Furthermore, we found differential association between the three different dimensions of race-related stress on the two identified factors. Specifically, we found that the institutional racism dimension was associated only with the anxiety factor, while the individual racism dimension was associated only with the depression factor. The cultural racism dimension was not significantly associated with either factor. Future directions and implications for research are discussed.

INDEX WORDS: depression, anxiety, race-related stress, tripartite, factor structure, African America
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by

TEMILOLA SALAMI
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MS, The University of Georgia, 2013

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by

TEMILOLA SALAMI

Major Professor: Steven Beach
Committee: Joan Jackson
Anne Shaffer

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
August 2016
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CHAPTER 1
INTRODUCTION

Depression and anxiety are common disorders in the United States, with depressive disorders affecting approximately 6.7% of the adult population and anxiety disorders affecting approximately 18.1% of the adult population in a given year (Kessler, Chiu, Demler, & Walters, 2005). Anxiety and depression are also highly comorbid (Brown, Campbell, Lehman, Grisham, & Mancill, 2001; Kessler, McGonagle, Nelson, Hughes, Swartz, & Blazer, 1994; Murphy, Horton, Laird, Monson, Sobol, & Leighton, 2004). Comorbidity estimates of anxiety and depression have been estimated to be as high as 57% in both clinical and community settings (e.g., Brown & Barlow, 1992; Kessler, Nelson, McGonagle, Lui, Swartz, & Blazer, 1996; Rodriguez et al., 2006; Zimmerman, McDermut, & Mattia, 2000). Individuals with comorbid anxiety and depression are more likely to experience more severe psychopathology, greater suicidality, poorer treatment outcomes, greater relapse, and reduced psychological functioning relative to those with a single diagnosis (e.g., Bronisch & Wittchen, 1994; Brown et al., 2001; Magee, Eaton, Wittchen, McGonagle, & Kessler, 1996; Reich, Warshaw, Peterson, & White, 1993).

Although much of the research examining the prevalence and course of depressive and anxious symptoms have been conducted with European American samples (Sue & Chu, 2003), there is emerging research examining racial differences in the expression and course of depression and anxiety (e.g., Himle, Baser, Taylor, Campbell, & Jackson, 2009; Zhang & Snowden, 1999). Studies examining racial differences in the prevalence rate of depressive
symptoms have found equivocal results. Some studies have reported higher rates in African Americans (Biafora, 1995; Eaton & Kessler, 1981; Miller, Malmstrom, Joshi, Andresen, Morley, & Wolinsky, 2004; Plant & Sachs-Ericsson, 2004; Stallones, Marx, & Garrity, 1990) while others have shown higher rates in European Americans or no difference between groups (Coyne & Marcus, 2006; Kelly, Kelly, Brown, & Kelly, 1999; Magnus, Shankar, Broussard, 2010; Zung, MacDonald, & Zung, 1988). Depressive symptoms in African Americans may be partially accounted for by economic (Plant & Sachs-Ericsson, 2004) and sociocultural factors; such as racial discrimination and race-related stress (Wight, Aneshensel, Botticello, & Sepulveda, 2005) that provide a unique context for understanding symptom formation and maintenance.

Additionally, African Americans have been found to report more somatic symptoms relative to affective and cognitive complaints as compared to European Americans. This may affect assessment validity or prevalence estimates (Brown, Schulberg, & Madonia, 1996; Brown, Schulberg, Sacco, Perel, Houck, 1999; Coyne, Schwenk, & Fechner-Bates, 1995; Greco, Brikman, & Routh, 1996; Heurtin-Roberts, Snowden, & Miller, 1997; Neal & Turner, 1991; Simon, Fleiss, Gurland, Stiller, & Sharpe, 1973). A study examining the prevalence of psychological symptoms in African American adults found that African Americans nonsignificantly reported more symptoms of depression and anxiety than European Americans (Rosenthal & Schreiner, 2000). Furthermore, psychological symptoms may be more debilitating for African Americans than for European Americans, and African Americans who experience symptoms of depression or anxiety are less likely to improve from treatment (Brown et al., 1999). Accordingly, there is considerable controversy regarding the best approach to assessment
of symptoms of anxiety and depression among African Americans, yet accurate assessment of comorbidity may be particularly important for this group.

The differential symptomatic presentation of depressive and anxious symptoms in African Americans, highlight the need to examine the structural relationships between anxiety and depression as well as their association with causal agents that are unique to African Americans. Such an examination may have broad implications for diagnosis and ultimately for treatment. The Diagnostic and Statistical Manual of Mental Disorders (DSM) has been critiqued for overlooking or minimally addressing racial differences in the different expressions of mental disorders (Kleinman & Good, 1985). In particular, it has been argued that diagnostic systems in widespread use reflect an “etic” perspective of the manifestation of mental disorders in which the expression of mental disorders is assumed to be universal and manifest similarly across all cultures and sub-populations (Cooper & Denner, 1998), despite evidence to the contrary.

Increasing evidence suggests that culture plays a role in the way mental disorders, including depression and anxiety, manifest, complicating the examination of prevalence and patterns of comorbidity. Cultural factors may also affect the degree to which particular risk factors are salient or contribute to symptoms, again potentially influencing the structure of symptom presentation with implications for optimal assessment. For example, African Americans and other ethnic minority populations may be at increased risk for psychopathology due to disproportionate distress associated with experiences of discrimination and racism (Johnson, 2006; Soto, Dawson-Andoh, & BeLue, 2011; Williams, Chapman, Wong, & Turkheimer, 2012). This may differ from the experiences of European Americans, resulting in different patterns of symptoms, different predictors of intensity of symptoms, or different response to intervention. Therefore, studies that address potential racial differences in the
etiology, expression, and categorization of mental disorders are likely to provide useful information regarding the manifestation of mental disorders in different groups, and provide useful insight into the treatment and prevention of these disorders.

Consistent with the supposition that there are important differences in the presentation of depression across racial categories, some researchers have speculated that African Americans are more likely to be misdiagnosed than are European Americans when diagnosed with emotion disorders such as depression (Borowsky, Rubenstein, Meredith, Camp, Jackson-Triche, & Wells, 2000; Neal & Turner, 1991). Specifically, they contest that the lower rates of mood disorders found with African Americans as compared with European Americans is a product of insensitive and faulty diagnostic assessments rather than true rates in African Americans (Bell & Mehta, 1981; Jones & Gray, 1986). However, not everyone in the field agrees with this notion, and the data supporting claims of misdiagnosis are ambiguous in that they are often derived from secondary analyses and utilize myriad amounts of methodological approaches that are not easily synthesized (Garretson, 1993; Good, 1992). Furthermore, African Americans are less likely to receive appropriate care after diagnosis (Melfi, Croghan, Hanna, & Robinson, 2000). The National Comorbidity Survey (NCS) reported that despite the fact that African Americans have lower rates of mood disorders, their symptoms are more treatment resistant than that of European Americans (Breslau, Kendler, Su, Gaxiola-Aguilar, Kessler, 2005; Sohail, Richie, & Kennedy, 2014). However, it is unclear if the persistence of illness within African American populations is a product of greater chronicity of symptoms within this population or a product of poorer health services. The best studied example of misdiagnosis in African Americans relates to psychotic symptoms in the context of affective disorders. African Americans are disproportionality diagnosed with schizophrenia relative to European Americans, with African Americans in
treatment settings being diagnosed at higher rates with schizophrenia than expected, and lower than expected rates of mood disorders (Baker & Bell, 1999; Neighbors, Jackson, Campbell, & Williams 1989). One explanation for misdiagnosis of psychopathology in African Americans is clinical bias, whereby physicians may only notice symptoms of depression that manifest more typically in European American samples. Therefore, they may overlook culturally specific manifestations of depression, misunderstand sub-culturally specific language and symptom description, or misclassify affective symptoms as evidence of psychosis (Bailey, Patel, Barker, Ali, Jabeen, 2011).

Another explanation relates to problems with the current nosological system and the limited incorporation of culturally relevant factors that may influence diagnosis. For example, studies examining the symptom cluster of depression have found systematic racial differences in the report of cognitive and somatic symptoms. Findings indicate that African Americans endorse more somatic symptoms relative to European Americans who tend to endorse more cognitive symptoms of depression (e.g., Heurtin-Roberts et al., 1997; Neal & Turner, 1991; Weissman, Bruce, Leaf, Florio, & Holzer, 1991). This seems to imply that the items included in the assessment of psychopathology might be sub-culturally specific and would be more valid if allowed to vary by sub-cultural context. African Americans’ differential symptom presentation calls into question the use of standard assessments of symptoms of anxiety and depression among ethnically diverse populations, particularly if such assessment instruments have been normed exclusively for European American samples. Therefore, inquiry into the way in which items assessing anxiety and depression cluster, relate to each other, manifest, and relate to culturally relevant stressors may provide useful information for the creation of a more accurate classification system for African Americans.
The co-occurrence of depressive and anxious symptoms across sub-populations highlight concerns about discriminant validity (Andrews, 1996; Brown, 1996; Clark, Watson, & Reynolds, 1995; Valentiner, Gutierrez, & Blacker, 2002). Self-report measures of depression and anxiety show particularly poor discriminant validity (Anderson & Hope, 2008; Joiner, Catanzaro, & Laurent, 1996) which has led to criticism about the differentiation of symptoms of anxiety and depression. Correlations between self-report measures of anxiety and depression have been found to be as high as .70 (e.g., Clark & Watson, 1991; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). Given the internal consistency of the scales, this is nearly as high as could be expected, suggesting limited discriminant validity. A meaningful model that is able to provide an understanding of the link between these two constructs can provide insight into their co-occurrence. Therefore, one aim of the present study is to examine the structure of depressive and anxious symptoms using items from the Beck Depression Inventory-II and the Beck Anxiety Inventory in order to attempt to replicate the basic factor structure found in prior research in an African American sample. In addition, we will examine how structural properties of anxiety and depression relate to race-related stressors, potentially influencing comorbidity.

Structural Models of Depression and Anxiety

Several explanations exist regarding the co-occurrence between depressive and anxious symptoms. Some researchers have proposed that the problems with comorbidity and co-occurrence of symptoms of depression and anxiety may indicate redundancy and arbitrary splitting of symptoms between these two conditions that may make it difficult for accurate diagnoses to be made (Frances, Widiger, & Fyer, 1990). These theorists propose a general distress factor - often called “negative affect” - that encompasses both symptoms of depression and anxiety. These theorists argue that the reason these symptoms are not easily distinguished is
that symptoms of depression and anxiety do not represent distinct constructs. Explanations of the overlap between symptoms of depression and anxiety indicate that these conditions may be variants of a more general underlying factor (Blashfield, 1990; Frances et al., 1990; Joiner et al., 1996) which develop from the same biological, psychological and/or genetic etiology, and manifest differently based on differential exposure to stress (Brozina & Abela, 2006). Consistent with this proposition, researchers have proposed a common etiology hypothesis, which states that anxiety and depression share a number of common causal, risk, and vulnerability factors (Brozina & Abela, 2006).

Other researchers propose that the overlap reflects the co-occurrence of structurally distinct constructs that may relate to each other. For example, the cognitive-content specificity hypothesis argues that there are specific affective and cognitive differences between symptoms of depression and anxiety (e.g., Beck, 1976; Beck, Rush, Shaw, & Emery, 1979). This hypothesis posits that depression and anxiety can be differentiated based on differential negative cognitive appraisals (Clark & Beck, 1989). According to this model, depression relates to automatic thoughts that focus on themes of loss, deprivation and inadequacy, and bring about feelings of sadness, worthlessness, fatigue and hopelessness (Burns & Eidelson, 1998). These themes are reflected in Beck’s Negative Cognitive Triad (Beck, 1976) which posits that individuals who are depressed experience depressogenic views about themselves, their world and their future. Alternatively, anxiety relates to automatic thoughts that bring about the belief of negative future consequences of physical or psychological harm, and produce feelings of fear, tension and arousal (Beck & Emery, 1985).

The cognitive-content specificity hypothesis leads to the expectation that symptoms of depression will predominate when there is relatively greater depressogenic cognitive content, and
that symptoms of anxiety will predominate when there is relatively greater anticipation of future threat. Therefore, examination of the cognitive-content specificity model is purported to provide insight into the differentiation of depression and anxiety, both symptomatically and diagnostically (Cho & Telch, 2005). Equivocal findings for the cognitive-content specificity hypothesis are noted with some studies showing no support (e.g., Beck, Benedict, & Winkler, 2003; Beck & Perkins, 2001; Clark, Beck, & Stewart, 1990; Siegert, Walkey, & Taylor, 1992) and others showing support for this model (Clark, Steer, & Beck, 1994; Laurent & Stark, 1993; McDermut & Haaga, 1994; Steer, Clark, Beck, & Ranieri, 1995). These equivocal findings seem to indicate that the cognitive-content specificity hypothesis may not be a comprehensive model in helping to understand the co-occurrence of symptoms of depression and anxiety.

The tripartite model of anxiety and depression (Clark & Watson, 1991) provided an elaboration of the common etiology hypothesis. According to this model, co-occurrence of symptoms of depression and anxiety occur because measures of anxiety and depression capture nonspecific factors of these conditions. Researchers have suggested that a higher order factor called “negative affect,” similar to that of the general distress model, may underlie co-occurring symptoms of depression and anxiety (Clark & Watson, 1991). In addition to accounting for the co-occurrence and overlap in anxiety and mood disorders, negative affect may be influential in determining the course and etiology of anxious and depressive symptoms that help with the understanding of how these disorders manifest (cf. Brown, Chorpita, & Barlow, 1998; Clark, Watson, & Mineka, 1994).

Clark and Watson (1991) conceptualized the tripartite model as a hierarchical model with negative affect providing insight into the nonspecific aspects of depression and anxiety. These investigators suggested that depression and anxiety contain unique as well as shared properties.
Negative affect represents the shared or nonspecific symptoms of depression and anxiety, and is a common factor of both depression and anxiety that relates to general psychological distress and negative mood. Physiological arousal relates to somatic tension, panic and nervousness, and is specific to anxiety. Anhedonia, which relates to loss of pleasure, apathy and hopelessness, is specific to depression, and therefore a good discriminator between depression and anxiety (Ahrens & Haaga, 1993; Cook, Orvaschel, Simco, Hersen, & Joiner, 2004; Dyck, Jolly, & Kramer, 1994; Jolly & Dyck, 1994; Tellegen, 1985; Watson, Clark, & Carey, 1988). It is worth noting that the greater prevalence of somatic symptoms of depression among African Americans suggests some potential difficulties for this formulation when applied to an African American sample.

Exploratory factor analytic studies have found strong support for the three factors of negative affect, physiological arousal, and anhedonia addressed in the tripartite model (Clark et al., 1994; Cook et al., 2004; Jolly & Dykman, 1994; Jolly & Kramer, 1994; Steer, Clark, & Ranieri, 1994). There is support for the tripartite model with different age groups, in college students, and in inpatient and outpatient samples (Brown et al., 1998; Chorpita, Albano, & Barlow, 1998; Cook et al., 2004; Joiner et al., 1996; Watson, Clark, Weber, Assenheimer, Strauss, & McCormick, 1995). Watson, Clark and colleagues (1995) conducted an exploratory factor analysis to examine the tripartite model, and found that consistent with the tripartite model, three factors emerged- general distress, anhedonia, and somatic arousal. They concluded that the more specific factors of depression and anxiety, which are anhedonia and physiological arousal, respectively, were more important to the implementation of appropriate treatments.
Support for Structural Models in African Americans

By 2050, investigators propose that ethnic minorities will account for over 50% of the population in the United States (Day, 1996). However, much of the research on mental health has been on European American populations and studies on the tripartite model are no exception. Given differences in contributing causes, as well as potential differences in structural manifestations of depression and anxiety in African American samples, it is important to examine the differential fit of alternative structural models within an African American sample (Gaylord-Harden, Elmore, Campbell, & Wethington, 2011; Lambert, Cooley, Campbell, Benoit, & Stansbury, 2004; Neal, Lilly, & Zakis, 1993; Steele, Little, Ilardi, Forehand, Brody, & Hunter, 2006). Comparing alternative models using African American samples can provide a more comprehensive view of symptoms of depression and anxiety, and hopefully lead to treatments that are more effective and provide greater diagnostic specificity (Joiner et al., 1996). Lambert, Cooley and colleagues (2004) examined the tripartite model in European American youth through confirmatory factor analysis, and found that the tripartite model fit the data better than a one-factor and a two-factor model (Lambert, McCreary, Joiner, Schmidt, & Ialongo, 2004). This finding is consistent with previous findings of the tripartite model.

Consistent with Lambert, McCreary and colleagues (2004), Gaylord-Harden and colleagues (2011) found that the tripartite model was a valid representation of anxiety and depression in African American youth. Furthermore, they found similar overlap between anxiety and depression, consistent with negative affect as the common element of depression and anxiety. In addition, they demonstrated that depression and anxiety were distinguishable through high levels of symptoms reflecting anhedonia and physiological hyperarousal, respectively. Gaylord-Harden and colleagues (2011) also demonstrated that internalizing symptoms in African
American youth seem to be better represented by somatic symptoms relative to more cognitive complaints. This is consistent with research showing that African Americans may be more likely to exhibit somatic complaints relative to cognitive complaints (e.g., Chapman, Williams, Mast, & Woodruff-Borden, 2009; Reynolds, O’Koon, Papademetriou, Szczygiel, & Grant, 2001). The experience of internalizing symptoms through somatic complaints may serve as a coping mechanism for African Americans and may be more adaptive than self-defeating symptoms such as sadness and low self-esteem. The experience of internalizing symptoms through somatic complaints may also serve as a culturally permissible expression of internalizing symptoms for this group (Gaylord-Harden et al., 2011; Reynolds et al., 2001; White & Farrell, 2006). Due to the differences found in the expression of depression and anxiety in African Americans, it is important to continue to examine the generalizability of the tripartite model in culturally diverse samples. In addition, because much of the work examining the tripartite model in African American populations has focused on African American children and youth, it is important to examine this model in adult samples as well.

Race-related Stress, Depression, and Anxiety in African Americans

African Americans are disproportionately exposed to stressful life events that may have associations to depressive and anxious symptoms. One area of particular concern is the disproportionate exposure of African Americans to race-related stressors; stressors that have been found to be associated with both depressive and anxiety symptoms (Clark, Coleman, & Novak, 2004; Gaylord-Harden et al., 2011; Gibbons, Gerrard, Cleveland, Wills, & Brody, 2004; Pascoe & Richman, 2009; Simons, Murry, McLoyd, Lin, Cutrona, & Conger, 2002; Wong, Eccles, & Sameroff, 2003). Race is a socially defined construct in which people are grouped based on skin color and physical features (Carter et al., 2013). These socially constructed
groupings of people have resulted in the marginalization of groups and the expression of racism by the dominant culture directed against underrepresented racial groups through the use of power at both individual and institutional levels (Carter, 2007; Carter et al., 2013). Chronic exposure to racism has been implicated in the onset of both physical and psychological distress in African Americans. For example, investigators have found that exposure to racism decreases African American participants’ levels of self-esteem, which has implications for the development of depressive and anxious symptoms (Fernando, 1984; Utsey, Ponterotto, Reynolds, & Cancelli, 2000).

Past research on psychopathology indicates that differential exposure to stressors can be used to understand and provide greater predictive validity of common and specific elements of depression and anxiety (Gaylord-Harden et al., 2011; Gunthert, Cohen, & Armeli, 2002). Furthermore, examination of stressors may provide greater understanding of the different manifestations of various structural factors and provide additional support for the validity of whatever model is found to be most accurate at capture symptoms among African Americans (Gunthert et al., 2002; Lambert, McCreary, et al., 2004). Given that race-related stressors and related psychological distress might be uniquely consequential for African Americans, understanding how these stressors differentially relate to symptoms of anxiety and depression, or to the facets of a broader structural model, may provide unique insight into the development and maintenance of these symptoms in African Americans.

To understand the differential impact of race-related stress on depression and anxiety for African Americans, investigators should consider its multidimensional nature (Jones, 1972; Utsey & Ponterotto, 1996). A multidimensional framework known as the tripartite model of racism was proposed by Jones (1972) to better capture the impact of different forms of racism on
the lives of African Americans. According to this model, there are three different forms of racism that affect the lives of African Americans. First, individual differences in the perception of “individual racism” reflect the belief that one has been directly discriminated against based on their race. Individual differences in the experience of “institutional racism” reflect the perception that the policies and practices of one’s society may intentionally or unintentionally result in the restriction of access, rights, and privileges of underrepresented groups while catering to the dominant culture. Last, individual differences in the experience of “cultural racism” reflects the belief that racially motivated practices and beliefs permeate one’s social context. The Index of Race-Related Stress (Utsey & Ponterotto, 1996) is a factor analytically derived measure used to assess the tripartite model of racism and focuses on manifestations of racism encountered by African Americans. This measure can be used to examine the association of dimensions of perceived racism with each other and with psychological and physical health (Carter, Forsyth, Mazzula, & Williams, 2005; Clark, Anderson, Clark, & Williams, 1999; Pascoe & Richman, 2009).

Race-related stressors often result in feelings of helplessness and hopelessness. However, the three different types of race-related stress may not be experienced equally by a given person and may have differential impact on psychological distress. For example, institutional racism, such as discrimination perceived to be perpetrated in the work place, may bring about high levels of hypervigilance, physiological arousal, and anxiety. Consistent with this proposition, stress in the work place and other institutional avenues have been linked to symptoms of anxiety (e.g., Ronen & Baldwin, 2010). Feelings of helplessness and the lack of perceived control over racially laden policies and practices of an organization may lead to hypervigilance, physiological arousal, and anxiety (e.g., Barlow, 1988; Mineka & Kelly, 1989). An individual’s symptoms may be
exacerbated due to feeling judged or blocked based on their membership in a racial minority group (e.g., Chan & Mendoza-Denton, 2008; Ronen & Baldwin, 2010).

On the other hand, because it is diffuse and difficult to identify a source, cultural racism may be seen as persistent and pervasive, producing feelings of hopelessness (Abramson, Metalsky, & Alloy, 1989) about one’s self, the world and the future. Individuals with greater experience of this form of discrimination may perceive their current situation as bleak and unchangeable due to overt and covert culturally discriminatory factors. Furthermore, self-reported hopelessness has been found to be associated with depressive symptoms (Alloy, Abramson, Walshaw, & Neeren, 2006; Ball, McGuffin, Farmer, 2008; Haeffel, 2010; Haeffel, Abramson, Brazy, Shah, Teachman, & Nosek, 2007; Hankin, 2005). We propose that the experience of racism directed towards an individual would produce both helpless and hopeless attributions, and would more likely be associated with general distress than the other two dimensions. Given the potential differential impact of various forms of racism on psychological symptoms, further assessment of race-related stress may provide even greater insight into factors that may influence common and specific elements of depression and anxiety in African American adults.

**Present Study**

The purpose of the present study was to examine the structure of symptoms of depression and anxiety in a community sample of African American adults. To date, most tests of the tripartite model and other structural models of depression and anxiety have been conducted with European Americans, with the bulk of the extant research on African Americans focusing on child, adolescent, and young adult populations. For greater generalizability of the tripartite model, further examination of these models in ethnic minority adult populations is warranted.
The differential expression of anxiety and depression in African American adults (e.g., greater somatic complaints), relative to European Americans (e.g., greater affective and cognitive complaints) further highlight the need for studies examining these models and their predictive utility in African American adult samples. To our knowledge, only one other study has examined the predictive utility of the tripartite model in African Americans with respect to race-related stress (see Gaylord-Harden et al., 2011). However, this study did not compare the tripartite model to other factor models. They also only examined this model in adolescent groups and investigated race-related stress globally. We expand on this research by focusing on adult populations, disaggregating racial stressors, and comparing one-, two-, and three-factor models.

We have two goals for the current proposal. Our first goal will be to examine one-factor (i.e., general distress factor), two-factor (i.e., cognitive specificity), and three-factor (i.e., tripartite) models in a community sample of African American adults using a confirmatory factor analytic approach to determine the best fitting model. Based on past research showing fit of the tripartite model, we hypothesize that the tripartite model will show better fit than the one- or two-factor models. Second, given the unique experience of race-related stressors among African Americans, we will correlate facets of perceived racism with specific structural dimensions of depression and anxiety. We hypothesize that the specific structural dimensions will be associated differentially with different aspects of experience with racism such that: a) experience with individual racism will be related to general negative affect more than it relates to other structural dimensions; b) perception of cultural racism will contribute uniquely to anhedonia; c) perception of institutional racism will contribute uniquely to physiological hyperarousal.
CHAPTER 2

METHOD

Participants

Participants were 245 African American adults (127 males and 118 females) recruited from a southeastern U.S. community via flyers to religious institutions, community centers, and word of mouth. Participants were between the ages of 18 to 60 years old ($M = 36.41, SD = 12.41$). Other demographic information is presented in Table 1.

Power Analysis

For our first hypothesis, using Muthén & Muthén’s (2002) method for determining sample size, assuming a normal distribution and missing data, we found that a comparison of CFA models would require a sample size of 175 for power of 0.81. This sample size would allow us adequate power for initial tests of the factor structure of both the BDI-II and the BAI. In addition, it provides adequate power for subsequent analyses that focus on subscales or facets of each measure. For our second hypothesis, an a priori power analysis conducted via G*Power (Cohen, 1977; Erdfelder, Faul, & Buchner, 1996) indicated that at $\alpha = .05$ and given a small to medium effect size ($f^2 = .07$), statistical power of .80 could be obtained with $n = 112$ participants. MPLUS analyses should have equal or better power to detect relationships than separate multiple regression analyses (Afifi, Clark, & May, 2004), accordingly, if there is sufficient power for the multiple regression analyses there should also be sufficient power for the MPLUS analyses. Based on these assessments, our sample of 245 participants seemed adequate for all study hypotheses.
Measures

**Demographics.** Participants were asked comprehensive demographic questions about their age, marital status, education and employment status.

**Beck Depression Inventory-II (BDI-II).** The BDI-II (Beck, Steer, & Brown, 1996) is a 21-item self-report instrument designed to assess severity of depressive symptomatology. Respondents’ scores on this measure are rated on a 0 to 3 scale with higher scores indicating more severe symptoms. The BDI-II is scored by summing the ratings; total scores range from 0 to 63. The BDI-II’s test-retest reliability has been shown to be stable, ranging from .60 to .93 (Beck, Steer, & Garbin, 1988). The BDI-II has been found to have moderate convergent validity ($r = .66$, $p < .001$) with a widely used measure of depressive symptoms in a sample of low-income African Americans (Joe, Woolley, Brown, Ghahramanlou-Holloway, & Beck, 2008). Past research has also found high internal consistency whereby alpha values range from .89 to .93 ($M = .91$) in college and community samples (Abela, Webb, Wagner, Ho, & Adams, 2006; Segal, Coolidge, Cahill, & O'Riley, 2008). Internal consistency for the BDI-II in the current sample was .92.

**Beck Anxiety Inventory (BAI).** The BAI (Beck, Epstein, Brown, & Steer, 1988) is a 21-item self-report inventory designed to assess symptoms of anxiety. Respondents are asked to rate the severity of their anxious symptoms on a scale from 0 to 3 during a one week interval. Scores can range from 0 to 63. The BAI was developed to provide improved discrimination between depression and anxiety, and it has shown improved discriminant validity compared to other widely used anxiety measures (Beck et al., 1988). The BAI has shown high short-term test-retest reliability and internal consistency with a reported coefficient alpha of .92, and a one-week test-retest of .75 (Beck et al., 1988). The BAI has also shown evidence of concurrent, convergent,
and discriminant validity with findings showing that the BAI scores correlated more highly with other indices of anxiety than that of depression (Beck & Steer, 1991; Fydrich, Dowdall, & Chambless, 1992). In a sample of African Americans, the BAI internal consistency has been found to be excellent with a reported coefficient alpha of .88 (Chapman & Woodruff-Borden, 2009). Internal consistency for the BAI in the current sample was .94.

*Index of Race-Related Stress-Brief (IRR-Brief).* The IRRS-Brief (Utsey, 1999) is a 22-item instrument that measures the cumulative stress experienced by African Americans as a result of chronic exposure to racism. The IRRS-Brief is multidimensional in nature and provides a global racism measure along with the following three subscales: cultural racism (“You seldom hear or read anything positive about Black people on radio, T.V., in newspapers or history books”), institutional racism (“You were passed over for an important assignment at work”), and individual racism (“You have been threatened with physical violence”) subscales. Respondents are asked to indicate which racism events they or a family member has experienced over their lifetime and then indicate the impact that each racism event had on them using a 5-point Likert scale (0 = this has never happened to me. 1 = event happened but did not bother me. 2 = event happened and I was slightly upset. 3 = event happened and I was upset. 4 = event happened and I was extremely upset). Summing the items for each IRRS-Brief subscale produces a total score for each race-related stress category. Higher scores on the IRRS-Brief subscales are indicative of higher levels of race-related stress in each perceived racism domain. The IRRS-Brief has been found to have adequate construct and convergent validity with another measure of stress as a result of racism (Racism and Life Experience Scale-Revised) (Utsey, 1999). Internal consistency for the IRRS-Brief has been reported to be adequate, with Cronbach’s alpha for the IRRS-Brief subscales ranging from .64 to .81 for college samples and community samples (Utsey, 1999;
Utsey, Chae, Brown, & Kelly, 2002). Internal consistency for the IRRS-Brief total score in the current sample was .93. The internal consistency for the cultural racism scale was .89, it was .76 for the individual racism subscale, and .73 for the institutional racism subscale.

Procedure

Recruitment proceeded in two phases. The first phase resulted in 150 participants recruited between December 2009 and November 2010. The second phase resulted in 95 participants recruited between January 2013 and January 2014. The process of data collection was standardized across the two time points through training and monitoring of the study research team. Equivalent to the first phase of data collection, in the second phase of data collection, potential study volunteers were invited to participate in a brief phone interview to assess age and appropriateness for study participation. Interviewees who were less than 18 years of age or who did not identify as Black/African American or who reported recent loss of consciousness due to substance use in the past two weeks were not included in the study. Self-reported substance use-related loss of consciousness was an exclusionary criteria because it may impact cognitive functioning and the participant’s subsequent capacity to provide informed consent. Small groups of approximately 5-10 participants were invited at each time point to the university campus for study participation. Each participant was informed that they would be administered a paper and pencil set of questionnaires that included questions about her/his behavior and experience of race-related stress, depression, and anxiety.

Upon consent, participants were administered a battery of questionnaires. The specific battery included- demographics form, Beck Depression Inventory-II, Beck Anxiety Inventory, and Index of Race-Related Stress-Brief. All participants were verbally debriefed and given a written debriefing form. Participants were informed that participation in the study could cease at
any time and referral for psychological services would be provided if needed. Approximately 20-minutes was required to complete the packet of questionnaires. Each participant received $20 as incentive for participating in the study. No participant demonstrated imminent risk of danger, or requested a referral for psychological services due to distress as a result of the study. Institutional Review Board approval was obtained for both phases of the study.
CHAPTER 3

RESULTS

Initial data cleaning, descriptive statistics, and measure intercorrelations were all conducted using SPSS version 20. All means, standard deviations, and intercorrelations for all measures are presented in Table 2. Several findings warrant further attention. The mean level of depressive ($M = 15.19; SD = 11.61$) and anxious ($M = 14.89; SD = 13.74$) symptoms fell in the minimal to moderate range, suggesting a range of symptoms with most participants below cutoffs for clinically significant levels of depressive and anxious symptoms. However, this mean level of psychological distress is consistent with past research (Abela & Sarin, 2002; Haeffel, 2010). Depressive symptoms and anxious symptoms were significantly correlated with one another ($r = .57, p < .001$). Depressive symptoms were significantly correlated with all race-related stress subscales [cultural ($r = .24, p < .001$); institutional ($r = .24, p < .001$); individual ($r = .29, p < .001$)]. Similarly, anxious symptoms were found to be correlated with all race-related stress subscales [cultural ($r = .15, p = .01$); institutional ($r = .24, p < .001$); individual ($r = .23, p < .001$)].

Data Analysis for Hypothesis One

To test hypothesis one, that the tripartite model would show better fit than a one- or two-factor model, we conducted confirmatory factor analyses (CFA) for each of the factor models using Mplus version 7.0 (Muthén & Muthén, 1998-2011). In order to assess potential latent constructs, factors were freely estimated and allowed to correlate with one another. Multiple fit indices were used to provide reliable estimates and evaluation of the models. The chi-square ($\chi^2$)
goodness of fit test is the standard test used to assess goodness of fit. Given that $\chi^2$ is highly sensitive to large sample sizes and will likely always be significant for large sample sizes, it has been recommended that $\chi^2$ be divided by degrees of freedom to provide a better estimate of fit. According to convention, a ratio of $\chi^2$ to degrees of freedom that is equal to or less than 2.0 indicates good model fit (Schumacker & Lomax, 1996). In addition to the chi-square goodness of fit test, several other fit indices were examined. These fit indices include the Comparative Fit Index (CFI; Bentler, 1990), the Tucker-Lewis Index (TLI; Bentler & Bonett, 1980; Bollen, 1989), and the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993). CFI or TLI values greater than .9 indicate a good fit (Hu & Bentler, 1999), while RMSEA values less than or equal to .05 indicate good fit (Browne & Cudeck, 1993). The Akaike’s Information Criteria (AIC) was used to determine the best fitting structural model. The AIC technique is used when comparing models from the same data set and is used to determine the most parsimonious model. When comparing models, a smaller AIC suggests better fit and greater parsimony (Akaike, 1974). We hypothesized that a three-factor model would emerge as superior to one and two-factor models, supporting prior research.

Hypothesis 1: Confirmatory Factor Analysis Model Fit and Model Comparison Results

A CFA approach was used to test the hypothesis that the three factor tripartite model would show better fit to the data than a one- or two-factor model. Using Mplus, items on the BDI-II and BAI were used to create latent factors for the three proposed models (i.e., one-, two-, and three-factor models) (see Table 3). The results of the CFA revealed that none of the factor models adequately fit the data. For the one-factor model, $\chi^2$/df ratio was 3.15, TLI = .64, CFI = .66, RMSEA = 0.09. All items significantly and positively correlated with each other. However, the BDI-II item 2 (“hopelessness;” factor loading = .31) did not load adequately on the single
overall negative affect factor based on the retention cutoff criteria (i.e., factor loading $\geq .35$).

Some convergence problems were also noted in that the BAI item 9 ("terrified") and item 17 ("scared") were highly correlated ($r = .70$). However, none of the standardized factor loadings of each item of the BAI and BDI-II was greater than 1.0 (see Figure 1).

For the two-factor model, $\chi^2$/df ratio = 2.17, TLI = .80, CFI = .81, RMSEA = .07. As expected, all items were significantly and positively correlated with each other. No convergence problems were noted for the two-factor model and no items were correlated at or above a .70. Furthermore, none of the standardized factor loadings of each of the BAI and BDI-II items were greater than 1.0 (see Figure 2).

For the three-factor model, $\chi^2$/df ratio was 2.86, TLI = .69, CFI = .71, RMSEA = .09. Correlational analysis of the three-factor model revealed a significant positive correlation between the depression and anxiety factors, $r = .60$, $p < .001$. The item loadings for the three-factor model for all the items on negative affect were significantly and positively correlated. However, the BDI-II item 9 ("suicidal thoughts"; factor loading = .20) and the BDI-II item 15 ("loss of energy"; factor loading = .27) did not load adequately on any factor based on the retention cutoff criteria (i.e., factor loading $\geq .35$). However, none of the items of the BAI and BDI-II were correlated at or above a .70 and none of the standardized factor loadings of each item was greater than 1.0 (see Figure 3). Correlational analysis of the three-factor model revealed a significant positive correlation between physiological hyperarousal and anhedonia, $r = .52$, $p < .001$. There was a very high level of correlation between negative affect and physiological hyperarousal ($r = .85$, $p < .001$), and between negative affect and anhedonia ($r = .88$, $p < .001$) (see Figure 3). The AIC analysis to test differences between the three models revealed that the AIC of the two-factor model (AIC = 22223.06) was smaller than that of the three-factor (AIC =
23715.442) and one-factor model (AIC = 22954.18), suggesting that the two-factor model is a more parsimonious and better fitting model to the data than the other two models.

_Hypothesis 1: Follow-up Exploratory Factor Analysis and Confirmatory Factor Analysis_

Given that all three models failed to achieve adequate fit to the data, we conducted a follow-up exploratory factor analysis (EFA) and a subsequent follow-up CFA of the BDI-II and BAI items using Mplus to determine if there was a better fitting model that would better capture symptom variance in an African American sample. We used a maximum likelihood parameter estimation with a geomin rotated solution for our EFA analysis. The geomin rotation is an oblique type of rotation that allows correlations between the factors resulting from the factor analysis. Decisions on how many factors to retain for our model was based on eigenvalues greater than or equal to 1 (Kaiser, 1960), as well as examination of the scree plot to identify the number of factors that should be extracted for our model (see Figure 4). Finally, interpretability of the model was used as a final benchmark to determine the number of factors to extract.

The EFA revealed that a two-factor solution was the best fit to our data. The eigenvalues for the unrotated factors were 14.35, 4.15, 1.55, 1.42, 1.22 and 1.15 indicating a sharp drop-off following the second factor and suggesting that the number of factors for rotation should be two. The loadings for the two retained factors can be seen in Table 4. With the exception of item 9 (“suicidal thoughts”) on the BDI-II which was removed due to a weak loading (i.e., factor loading < .35), all factors loaded distinctly on one of two factors and no items double loaded. Although the EFA analysis revealed that the two-factor model showed better fit to the data than other factor models, the fit of the two-factor model examined with the EFA still did not show acceptable fit to the data ($\chi^2/df = 2.13$, TLI = .81, CFI = .83, RMSEA = 0.07).
Given that the EFA showed greater fit of the two-factor model relative to other factor models, we re-examined the two-factor solution using a CFA. We modified our model using modification indices created with Mplus. We allowed correlations between indicators if they were within the same factor and had a modification index greater than 10. The modification indices using Mplus indicated that improved model fit could be obtained by allowing 3 item correlations within the depression factor and 13 item correlations within the anxiety factor. See Table 5 for a summary of these correlations and Figure 5 for item loading information. Furthermore, given that item 9 (“suicidal thoughts”) on the BDI-II did not load adequately on any factor conducted with the EFA, this item was removed from the secondary CFA analysis. The resulting two-factor model fit the data well ($\chi^2$/df < 2, TLI = .90, CFI = .91, RMSEA = 0.05)

*Data Analysis for Hypothesis Two*

To test hypotheses 2a to 2c which state that there will be differential association with the three different race-related stress subscales on common and specific elements of depressive and anxious symptoms found in the tripartite model, a multivariate multiple regression analysis was proposed. However, given that a two-factor solution showed greater fit and parsimony than a three-factor hierarchical solution in our previous analyses, the two-factor model and not the three-factor model was used in this analysis. That is, the anxiety factor in our two-factor model was correlated with all three of the race-related stress subscales, and the depression factor of our two-factor model was correlated with all three of the race-related stress subscales. Mplus was used to conduct simultaneous modeling of the dependent variables in order to account for the correlations between these variables.
Hypothesis 2: Differential Association of Race-Related Stress

Results related to hypothesis two are summarized in Figure 6. Note that all coefficients reflect effects of each race-related stress subscale while controlling for other race-related stress subscales. The Mplus analysis revealed that perceived individual racism was significantly and positively associated with the depression factor ($\beta = .24$, $p = .03$), while perceived cultural ($\beta = .06$, $p = .60$) and institutional racism ($\beta = .02$, $p = .86$) were not associated with the depression factor when controlling for the other race-related stressors. However, perceived institutional racism was significantly and positively associated with the anxiety factor of our two-factor model ($\beta = .23$, $p = .03$), while perceived cultural racism ($\beta = -.13$, $p = .21$) and perceived individual racism ($\beta = .13$, $p = .22$) were not associated with the anxiety factor when controlling for the other race-related stressors.
CHAPTER 4
DISCUSSION

Studies examining the factor structure of depression and anxiety have typically been conducted with European Americans. However, based on past research there is reason to believe that the factor structure and item loadings of models of depression and anxiety may differ for African American samples (e.g., Gaylord-Harden et al., 2011; Heurtin-Roberts et al., 1997; Lambert et al., 2004; Neal & Turner, 1991; Weissman et al., 1991). It is important to directly examine the structural relationship between symptoms of depression and anxiety among African Americans to provide a more sound foundation for treatment and assessment for this group. Therefore, the current investigation primarily aimed to discover the factor structure of the BAI and BDI-II in African American adults by comparing three previously proposed models using factor analyses. It was expected that a three-factor hierarchical structure would fit the data better than a one- or two-factor solution, such that both common and specific elements of depression and anxiety would be captured in the model. Both the BAI and BDI-II have previously been employed to examine the tripartite model of depression and anxiety in European American samples. These studies have found support for the tripartite model of depression and anxiety whereby both common and shared factors were identified (Clark et al., 1994; Steer et al., 1995; Steer et al., 2008). The secondary aim of this investigation was to determine if specific structural dimensions derived from the BAI and BDI-II would be differentially associated with a unique form of stress that African Americans experience, namely race-related stress.
Integration of Previous Research: Structural Models

Previous research on structural models have typically found support for the tripartite model as a broader yet more parsimonious model that elucidates the patterns of symptom association between depression and anxiety than other proposed models (e.g., Chorpita et al., 1998; Clark et al., 1994; Cook et al., 2004; Jolly & Dykman, 1994; Jolly & Kramer, 1994; Steer et al., 1994). However, analyses examining and comparing models of depression and anxiety within the current sample of African Americans showed a different pattern of results than has been reported by proponents of the tripartite model. Specifically, the results of the original CFA for the one-factor, two-factor, and three-factor models revealed that none of the factor models fit the data well for our African American group. This finding was surprising given our expectation that a three-factor hierarchical tripartite model would show adequate fit. These findings further highlight the need for investigators to examine the factor structure of depression and anxiety in ethnically diverse samples.

Due to the poor fit of our models, we conducted an exploratory analysis and model comparison analyses, which revealed that a modified two-factor model that allowed for item correlations within measures of depression and anxiety provided the best and most parsimonious fit to the data. The modified model showed good fit to the data, and showed distinct anxiety and depression factors. All items of the BAI and BDI-II loaded on their proposed factors with the exception of the suicidal thoughts item, which did not load on any factor. Although it is unclear why the suicide ideation item did not load onto any factor, it might be due to the limited endorsement of this item by the individuals in this study. A sample with greater symptom severity might be more likely to endorse the suicidal thoughts item (Gensichen, Teising, König, Gerlach, & Petersen, 2010; Heisel, Conwell, Pisani, & Duberstein, 2011; Keilp et al., 2012;
Nock, Hwang, Sampson, & Kessler, 2010) and thus provide greater insight into the loading of this item. Overall, this study seems to suggest that the symptoms of depression and anxiety derived from the BAI and BDI-II represent divergent yet correlated factors. However, the high degree of modifications needed to acquire adequate fit of the two-factor model calls to question the generalizability of our model for future samples of African Americans.

There are a few possible explanations for the poor fit of all our proposed models during the initial analyses and the modifications needed to attain model fit in the secondary analyses of fit. First, the poor fit of our models might be because the instruments used to assess the proposed model are inadequate for capturing these models; particularly the tripartite model of depression and anxiety. The items of the BAI and BDI-II were chosen to provide strong internal consistency in that they have a high degree of correlation between their individual items. Although tests of internal consistency, convergent validity, and discriminant validity of the BAI and BDI-II have typically been assessed with European American samples, report of strong psychometric prosperities of both the BAI and BDI-II have also been reported for African Americans (Chapman & Woodruff-Borden, 2009; Joe et al., 2008). Therefore, given the items of the BAI and BDI-II were specifically selected for their item convergence, these measures may not provide a sensitive enough index to capture the overlapping latent construct of depression and anxiety. Second, the BAI and BDI-II may not accurately capture depression and anxiety for African Americans, and instruments derived from a more emic perspective might provide more accurate information about the structure of depression and anxiety. This notion has been proposed by previous researchers (Barg et al., 2006; Good, 1997; Kleinman & Good, 1985; Phan, Steel, & Silove, 2004). A third explanation for our findings is that the depression and anxiety factors are more distinct than has been reported for European Americans. That is, clear
distinctions can be made between depression and anxiety for African Americans without the overlapping negative affect factor. Therefore, the modified two-factor solution represents the best and the most parsimonious model, and thus should generalize to other African American samples.

Previous investigators have found support for a two-factor solution (anxiety vs. depression factors) relative to a tripartite solution. A study by Burns & Eidelson, 1988 examined the tripartite model using the Mood and Anxiety Symptom Questionnaire (MASQ) with a college sample and an outpatient clinical sample finding that the tripartite model did not fit the data for both groups. They tested a two-factor solution of depression and anxiety as an alternative model and found support for this solution for both their college and clinical samples. Though the results of this study is in line with the results of the current investigation, the Burns & Eidelson, 1988 study has been criticized for its use of subscale scores rather than item-level analyses when examining the tripartite model (Boschen, & Oei, 2006; Buckby, Cotton, Cosgrave, Killackey, & Yung, 2008). Although a subscale analysis relative to an item level analysis can decrease the sample size needed for a CFA due to the truncated number of parameters required, the use of subscales can significantly influence the outcome of a CFA analysis (Buckby et al., 2008; Keogh & Reidy, 2000) and may account for the differences found with studies focusing on item-level analyses. Furthermore, this study has been criticized for its removal of the MASQ General Distress-Mixed subscale from its analyses as this subscale score has been reported to be the one most strongly related to the higher order negative affect factor (Boschen & Oei, 2006). However, the Burns & Eidelson, 1988 study does not stand alone, and other researchers examining the structural model of depression and anxiety have found support for a two-factor solution as well (Buckby et al., 2008; Epkins & Meyers, 1994; Lonigan, Hooe,
David, & Kistner, 1999; Ollendick, Seligman, Goza, Byrd, & Singh, 2003). These studies coupled with the current investigation imply that the tripartite solution of depression and anxiety might not be robust across different groups. It is thus important that future research examine the limits of the tripartite model with different populations in order to heighten the clinical utility of measures of depression and anxiety with various groups.

Integration of Previous Research: Race-Related Stress

Stressful life events have been found to be associated with the onset of symptoms of depression and anxiety (Hammen, 2005; Kendler, Hettema, Butera, Gardner, & Prescott, 2003; Kendler, Karkowski, & Prescott, 1998; Paykel, 2003). For African Americans, examining culturally relevant stressors such as race-related stress might be particularly important to understand and predict the onset of depression and anxiety. Racial stressors such as the experience of racism and discrimination have been found to be associated with psychological distress for African Americans (Broman, Mavaddat, & Hsu, 2000; Carter, 2007; Clark et al., 2004; Klonoff, Landrine, & Ullman, 1999;Thoits, 1991; Utsey et al., 2000). However, the experience of racism may not be a unitary experience and different experiences of race-related stressors may differentially influence the development of psychological distress. Furthermore, an examination of different forms of race-related stressors that uniquely plague African Americans may additionally provide support for the validity of structural models of depression and anxiety for this group.

Although we originally proposed to examine race-related stress on common and specific elements of depression and anxiety using a three-factor solution, given that the current study found support for a two-factor solution relative to other solutions, analyses were conducted for the two-factor solution alone. We found support for the differential impact of the three forms of
race-related stress on the depression and anxiety factors. We initially predicted and found support for the proposition that the institutional racism dimension would be associated with anxiety due to greater levels of helplessness and hypervigilance that may occur after the perception of institutional racism. These heightened levels of hypervigilance, and subsequent anxiety may ensue in places like the workplace and other institutional avenues (Ronen & Baldwin, 2010) where individuals may experience racial discrimination and denial of access due to their race. Though we originally proposed that cultural racism would be associated with symptoms of depression and individual racism would be associated with a general distress factor, given that we examined a two-factor solution, we found a different pattern of results. Specifically, cultural racism was not associated with either anxiety or depression, but individual experience of racism was associated with depression, and perceived institutional racism was associated with anxiety.

It is possible that the experience of individual racism leads an individual to internalize these beliefs, and develop negative beliefs about themselves, their world and their future. Furthermore, the perception of individual racism that are out of a person’s control may reflect a type of personal loss event that are race-related, creating a more global expectation of future loss. Although this was not directly tested, these internalized and global negative beliefs may lead to the development of depressive symptoms (Beck, 1976).

It is surprising that the cultural racism dimension was not associated with either the depression or the anxiety factor. A potential explanation for the lack of significant findings for the cultural racism dimension is that individuals who perceive prevalent and pervasive forms of cultural racism may be desensitized to these experiences, and thus may not internalize these experiences as meaning anything about them. Therefore, individuals who experience cultural
racism may distance themselves from these negative experiences as a means to cope (see Leets, 2001). At first glance, these findings seem in opposition to the cultural dysthymia hypothesis proposed by Vontress and colleagues (2007) which states that the systematic prejudice, discrimination and injustice faced by African Americans bring about chronic low-grade symptoms of depression, hopelessness and anger. However, it is possible that current measures of depression are not sensitive enough to capture these low-grade, widespread and culturally dependent symptoms of depression. Another possible explanation for these lack of significant findings is that individuals who experience cultural racism may be equipped with buffering factors (e.g., cultural pride messages, discussing racial barriers and prejudice in America, coping through religion and spirituality) that may influence resilience rather than psychological adversity (Brown & Tylka, 2011; Bynum, Burton, & Best, 2007; Hughes, Rodriguez, Smith, Johnson, Stevenson, & Spicer, 2006; Neblett, Philip, Cogburn, & Sellers, 2006). Resilience is defined as “overcoming the negative effects of risk exposure, coping successfully with traumatic experiences, and avoiding the negative trajectories associated with risks” (Fergus & Zimmerman, 2005, p. 399). Socializing agents such as parents, community members and pastors may equip African American youth with methods to cope with the experience of racism (see Brown & Tylka, 2011). Such early socialization practices may enhance resilience after an adverse racially discriminatory event.

With respect to institutional racism, the results of the current analyses are in line with our hypothesis that institutional racism would be associated with physiological hyperarousal and anxiety. Institutional racism like those encountered in the workplace are related to factors such as poor job performance, decreased work satisfaction, reduced workplace productivity, and greater rates of absenteeism (Buttner, Lowe, & Billings-Harris, 2010; Holder & Vaux, 1998; Trenerry,
Franklin, & Paradies, 2012). Racially laden policies and practices that subjugate individuals may produce greater workplace stress that further decrease an individual’s ability to perform adequately at their job. Consistent with this proposition, stress in the workplace and other institutional avenues have been linked to symptoms of anxiety (e.g., Barlow, 1988; Mineka & Kelly, 1989; Ronen & Baldwin, 2010). The current findings support the proposition that experiences of racism will differentially impact symptoms of depression and anxiety. Therefore, future research catered to understanding the mechanisms by which different experiences of race-related stress lead to symptoms of depression and anxiety is necessary to further our understanding of these associations and aid with greater accuracy with differential diagnoses among African American adults.

**Strengths, Limitations, and Future Research**

The present study is not without its limitations. First, the current investigation relied on self-report paper-pencil instruments to assess symptoms of depression, anxiety and race-related stress. Therefore, there is a possibility that study participants were not accurate or honest in their report of these symptoms. Past investigators have reported that African Americans may perceive the experience of stigma or embarrassment with their report of mental health concerns, and thus they may be more likely to distort or underreport their experience of these symptoms (Brown, Ahmed, Gary, & Milburn, 1995; Shorter-Gooden, 2009; Thompson, Bazile, & Akbar, 2004; Ward & Heidrich, 2009). Therefore, alternative methods of questionnaire administration could yield a different pattern of results. Future research might benefit from also employing clinical interviews or multi-informant methodology.

Second, the cross-sectional design of this study does not allow causal conclusions about the impact of race-related stress on depressive and anxious symptoms that a prospective design
would permit. Given our cross-sectional design, we could not fully assess the predictive validity of race-related stress on symptoms of depression and anxiety. Accordingly, future prospective examinations on the impact of race-related stress on dimensions of depression and anxiety would extend the current research. However, it is unlikely that race-related stress would show greater strength in a longitudinal context than they did in a cross-sectional context. Therefore, the current pattern of findings seems particularly relevant to our research question.

Third, although power analyses revealed that our sample size was adequate to attain acceptable power for our proposed models, it is likely that the results found with the CFAs and EFA analyses might be sample specific. Therefore, in order to assess the generalizability of our proposed model to other subgroups, cross-validation analyses would need to be conducted by future investigators. Similarly, almost half of our sample of African Americans were unemployed and living in low-income neighborhoods. This relatively homogenous sample further limits generalizability of our findings to African Americans from middle and upper class communities. Therefore, future research examining socioeconomic variables that may influence the pattern of results may be needed to provide more accurate information about the structure of depression and anxiety in a heterogeneous sample of African Americans.

Fourth, previous investigators have reported that due to the high internal consistency of the BAI and BDI-II, these measures may not be adequate at capturing the hierarchical structural model proposed by proponents of the tripartite model (Watson, Weber, Assenheimer, Clark, Strauss, & McCormick, 1995), and thus may explain our poor fitting tripartite model. Therefore, future investigations may need to use other measures such as the MASQ, which was specifically designed to assess the three-factor structure of the tripartite model proposed by Clark and Watson, 1991. However, the MASQ is not without its limitations and previous investigators have
criticized previous studies that have used the MASQ for using less sophisticated testing to derive the factor structure of anxiety and depression (Boschen & Oei, 2006). Furthermore, the MASQ has been criticized for its lack of consistency in showing a tripartite factor structure in different samples (Keogh & Reidy, 2000). Thus, future research may benefit from developing and utilizing measures that can be subject to stringent testing of the proposed factor structures of depression and anxiety in various populations.

Fifth, we did not directly address the cognitive content-specificity hypothesis as this was outside of the scope of the current investigation. A greater understanding of the differential cognitive content of depression and anxiety in an African American sample may help improve the specificity of clinical instruments for this group. Therefore, future research examining a two-factor solution in African Americans may benefit from employing a research design that can assess the cognitive content-specificity hypothesis in order to better understand and differentiate depression and anxiety symptomatology. Furthermore, analysis of the cognitive content-specificity hypothesis in African Americans will allow for evidence regarding the generalizability of this hypothesis for this group. This research is particularly important given the paucity of studies specifically testing the cognitive content-specificity hypothesis in African American samples.

Despite these limitations, there are several strengths to the current study. This is one of the first investigations of the symptom structure of depression and anxiety, and the differential association of race-related stressors in a community sample of African American adults. This study uncovers potential differences in the structure of symptoms of depression and anxiety for African American adults as compared to prevailing research with European Americans. Therefore, this research provides us with useful insight about the relationship between anxiety
and depression in African Americans that may potentially aid diagnostic and treatment evaluations. Furthermore, the use of a culturally relevant stressor to help predict symptoms of depression and anxiety will aid clinicians with symptom differentiation for African Americans samples.

Conclusion

Overall, this study calls to question the validity of the tripartite model as a way to understand structural models of depression and anxiety for African Americans. Although previous research has typically found support for the tripartite model of depression and anxiety, it is important to continue to address the validity of these models with ethnically diverse populations. Given the differing expressions and manifestations of depression and anxiety based on cultural and contextual factors, the way in which the items of depression and anxiety relate to each other may vary for different groups. In order to heighten diagnostic and treatment accuracy for symptoms of depression and anxiety, future research would need to continue to assess the predictive utility of relevant cultural stressors on different components of structural models of depression and anxiety.
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<td>Married or partnered and living with significant other</td>
<td>43</td>
<td>17.60</td>
</tr>
<tr>
<td>Separated or divorced</td>
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<td>17.60</td>
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<td><strong>Gender</strong></td>
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<tr>
<td>Employed</td>
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<td>42.82</td>
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<tr>
<td>Missing</td>
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</table>
Table 2

*Means, Standard Deviations, and Intercorrelations for All Measures*

<table>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
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<td>1. BDI</td>
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<td>2. BAI</td>
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<td>3. IRRSInd</td>
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<td>5. IRRSCul</td>
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<td>.74**</td>
<td>.74**</td>
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<td>13.74</td>
<td>6.01</td>
<td>5.99</td>
<td>10.95</td>
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</table>

*Note.* BDI = Beck Depression Inventory-II. BAI = Beck Anxiety Inventory. IRRSInd = Index of Race-Related Stress. Individual Racism Subscale. IRRSInst = Index of Race-Related Stress. Institutional Racism Subscale. IRRSCul = Index of Race-Related Stress. Cultural Racism Subscale.

* p < .05. ** p < .01.
Table 3

**One- Two-Three-Factor Models of the BAI and BDI-II Items**

<table>
<thead>
<tr>
<th></th>
<th>Two Factor Model</th>
<th>Three Factor Model</th>
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<tbody>
<tr>
<td>Anxiety</td>
<td>Depression</td>
<td>Negative Affect</td>
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<tr>
<td>Feeling hot</td>
<td>Sadness</td>
<td>Loss of pleasure</td>
</tr>
<tr>
<td>Wobbliness</td>
<td>Pessimism</td>
<td>Guilty feelings</td>
</tr>
<tr>
<td>Unable to relax</td>
<td>Past failure</td>
<td>Punishment feelings</td>
</tr>
<tr>
<td>Fear of worst</td>
<td>Self-criticalness</td>
<td>Self-dislike</td>
</tr>
<tr>
<td>Dizzy</td>
<td>Worthlessness</td>
<td>Suicidal thoughts</td>
</tr>
<tr>
<td>Unsteady</td>
<td>Loss of interest in sex</td>
<td>Crying</td>
</tr>
<tr>
<td>Terrified</td>
<td>Loss of pleasure</td>
<td>Agitation</td>
</tr>
<tr>
<td>Nervous</td>
<td>Guilty feelings</td>
<td>Indecisiveness</td>
</tr>
<tr>
<td>Hands trembling</td>
<td>Punishment feelings</td>
<td>Loss of energy</td>
</tr>
<tr>
<td>Fear of losing control</td>
<td>Self-dislike</td>
<td>Change in sleep</td>
</tr>
<tr>
<td>Fear of dying</td>
<td>Suicidal thoughts</td>
<td>Irritability</td>
</tr>
<tr>
<td>Scared</td>
<td>Crying</td>
<td>Change in appetite</td>
</tr>
<tr>
<td>Indigestion</td>
<td>Agitation</td>
<td>Dizzy</td>
</tr>
<tr>
<td>Numbness</td>
<td>indecisiveness</td>
<td>Tiredness</td>
</tr>
<tr>
<td>Heart pounding</td>
<td>Loss of energy</td>
<td>Feeling hot</td>
</tr>
<tr>
<td>Feelings of choking</td>
<td>Change in sleep</td>
<td>Wobbliness</td>
</tr>
<tr>
<td>Shaky</td>
<td>Irritability</td>
<td>Unable to relax</td>
</tr>
<tr>
<td>Difficulty breathing</td>
<td>Change in appetite</td>
<td>Fear of worst</td>
</tr>
<tr>
<td>Faint</td>
<td>Tiredness</td>
<td>Hands trembling</td>
</tr>
<tr>
<td>Flushed face</td>
<td>Difficulty concentrating</td>
<td>Fear of dying</td>
</tr>
<tr>
<td>Sweating</td>
<td></td>
<td>Fear of losing control</td>
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*Note:* The one-factor model included all items from the BDI-II and BAI
Table 4

Two-Factor EFA Model Solution with Gramin Rotated Loadings

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<tr>
<th>Items</th>
<th>Factor Loadings</th>
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<th>Factor Loadings</th>
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<td>Factor 1</td>
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<tr>
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<tr>
<td>Wobbliness</td>
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<td>.46</td>
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<tr>
<td>Unable to relax</td>
<td>.28</td>
<td>.43</td>
<td>.53</td>
</tr>
<tr>
<td>Fear of worst</td>
<td>.26</td>
<td>.48</td>
<td>.59</td>
</tr>
<tr>
<td>Dizzy</td>
<td>.08</td>
<td>.65</td>
<td>.50</td>
</tr>
<tr>
<td>Unsteady</td>
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<tr>
<td>Terrified</td>
<td>.01</td>
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<tr>
<td>Nervous</td>
<td>.14</td>
<td>.54</td>
<td>.60</td>
</tr>
<tr>
<td>Hands trembling</td>
<td>-.00</td>
<td>.76</td>
<td>.61</td>
</tr>
<tr>
<td>Fear of losing control</td>
<td>.12</td>
<td>.64</td>
<td>.61</td>
</tr>
<tr>
<td>Fear of dying</td>
<td>.08</td>
<td>.61</td>
<td>.22</td>
</tr>
<tr>
<td>Scared</td>
<td>.18</td>
<td>.61</td>
<td>.57</td>
</tr>
<tr>
<td>Indigestion</td>
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<td>.57</td>
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<tr>
<td>Numbness</td>
<td>.13</td>
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<td>.67</td>
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<tr>
<td>Heart pounding</td>
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<tr>
<td>Feelings of choking</td>
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<tr>
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<td>Difficulty breathing</td>
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<tr>
<td>Faint</td>
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<tr>
<td>Flushed face</td>
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<tr>
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</table>

concentrating
Table 5

<table>
<thead>
<tr>
<th>CFA Modification Index</th>
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<tr>
<td>NBAI8 WITH NBAI7</td>
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<tr>
<td>NBAI10 WITH NBAI4</td>
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<tr>
<td>NBAI11 WITH NBAI4</td>
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<tr>
<td>NBAI13 WITH NBAI12</td>
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<tr>
<td>NBAI21 WITH NBAI20</td>
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</tbody>
</table>
Figure 1: One-factor model with Beck Anxiety Inventory Items
Figure 1 continued: One-factor model with Beck Depression Inventory-II items
Figure 2: Two-factor model with the anxiety symptom factor. All Beck Anxiety Inventory-II items loaded on the Anxiety factor.
Figure 2 continued: Two-factor model with the depression symptom factor. With the exception of item 9 ("suicidal thoughts"). All Beck Depression Inventory-II items loaded on the depression factor.
Figure 3: Tripartite model. Beck Depression Inventory-II items are italicized.
Figure 4: Scree Plot of Eigenvalues.
Figure 5: Two-factor model with the anxiety symptom factor after model modifications
**Figure 5 continued:** Two-factor model with the depression symptom factor after model modifications.
**Figure 6:** Path coefficients for the association of dimensions of race-related stress on depressive and anxious symptoms while controlling for other dimensions. 

*p < .05. ***p < .001.