Ethnic Group Differences in Affective, Behavioral, and Cognitive Markers of Anxiety

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Ethnic group differences in affective, behavioral, and cognitive measures of anxiety were examined to better characterize the unique triggers and modes of anxious responding across different groups. Using an ethnically diverse sample ($N = 112$; 39 African Americans, 34 Asian Americans, and 39 European Americans), the study examined differences in anxious responding following three anxiety provocations (physical, social interpersonal, and social performance), each hypothesized to be a primary anxiety trigger for one of the groups. African Americans and European Americans demonstrated greater behavioral avoidance during a physical provocation designed to elicit shortness of breath sensations relative to Asian Americans. Asian Americans reported a higher number of anxious cognitions than African Americans during a social provocation designed to trigger performance concerns. These findings suggest ethnicity should be carefully considered when assessing the predominant triggers of anxiety and modes of anxious responding.

**Keywords:** anxiety; ethnicity; African Americans; Asian Americans; self-construal

Psychologists have increasingly recognized the importance of ethnicity in understanding psychopathology and emotion regulation (Kirmayer, 2001). This is evident by the growing literature on ethnic differences in prevalence rates and treatment-seeking behaviors. As a result, the field is now ready for research to also address differences in the expression and phenomenology of various forms of psychopathology (Zvolensky, McNeil, Porter, & Stewart, 2001). The current study focuses on ethnic differences in the triggers and expression of anxiety symptoms because of the ubiquitous and serious nature of anxiety problems (lifetime prevalence of anxiety disorders in adults is approximately 25%; Narrow, Rae, Robins, & Regier, 2002) and because of important early indications that anxiety may not operate the same way across ethnic groups (Good & Kleinman, 1985; Kirmayer, Young, & Hayton, 1995).

Epidemiological reports (e.g., Regier et al., 1984) suggest equivocal findings regarding the prevalence rates of various anxiety disorders across different ethnic and cultural groups.

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Several studies have reported similar prevalence rates for panic disorder with or without agoraphobia, social phobia, and obsessive–compulsive disorder for African Americans and European Americans (Horwath, Johnson, & Hornig, 1994; Karno & Golding, 1991; Smith, Friedman, & Nevid, 1999), though Brown, Eaton, and Sussman (1990) found an elevated 1-month prevalence rate for social phobia for African Americans when compared to European Americans. Other studies suggest increased rates of agoraphobia and specific phobias for African Americans in comparison to European Americans (e.g., Horwath et al., 1994). For Asian Americans, a number of studies have indicated higher rates of social anxiety and greater apprehension relative to European Americans (e.g., Okazaki, 1997; S. Sue & Zane, 1985; Watson & Friend, 1969; Zane, Sue, Hu, & Kwon, 1991). These mixed results demonstrate that prevalence differences alone cannot explain how ethnicity and culture influence the experience of anxiety; thus, we consider ethnic differences in the phenomenology (rather than just frequency) of anxiety.

The present study investigates the specific stimuli that engender anxiety and the unique cognitions that characterize the experience of anxiety and motivate avoidance for individuals from African American, Asian American, and European American backgrounds. To examine the anxiety triggers that are dominant for each group, the study includes a series of anxiety provocations (physical, social interpersonal, and social performance) and assesses affective, behavioral, and cognitive markers of anxiety responding. As we outline below, the emphasis on variable triggers of anxiety follows from cross-cultural models of emotional experience and regulation (Good & Kleinman, 1985; Kitayama & Markus, 1994) that suggest anxiety provocations may be interpreted very differently across ethnic groups. Furthermore, inclusion of the multimodal assessment of anxious responding is based on prominent models that highlight frequent inconsistencies across anxiety measures (e.g., Lang, 1985).

**Ethnic Group Differences in Anxiety Triggers**

**Anxiety and African Americans: Focus on Physical Concerns**

Researchers have noted the lack of a theoretical framework to guide scientific investigations of anxiety in African American populations (Carter, Sbrocco, & Carter, 1996). In the current work, we draw from the theory of healthy cultural paranoia (often termed cultural mistrust; Terrell & Terrell, 1981), which describes the tendency for African Americans to demonstrate paranoid-like behaviors in interracial contexts as a result of historical and contemporary racism (Grier & Cobbs, 1968; Terrell & Terrell, 1981; Whaley, 2001, 2004). At the crux of this theory is the notion that experiences of racism and oppression, and knowledge of such occurrences, engender vigilance and mistrust toward European Americans in certain contexts.

We extend this model to propose a link between anxiety and physical symptoms for African Americans. Specifically, given the higher prevalence of a number of physical diseases in this group relative to European Americans (e.g., diabetes, hypertension, cardiovascular disease, stroke, etc.; Anderson, McNeilly, & Myers, 1993; Kalinowski, Dobrucki, & Malinski, 2004; Kulig, 2006; National Stroke Association, n.d.), African Americans may possess a distinct sense of vulnerability to such illnesses. Thus, a parallel is drawn between the higher base rates of racism and higher base rates of physical disease for African Americans. Supporting this hypothesis, in a prior study, we found that African American
college students reported a significantly higher perceived risk of cardiovascular disease relative to European Americans (Gordon & Teachman, 2006). As a result of this heightened sense of vulnerability, physical symptoms of anxiety that are cues relevant to physical illness, such as increased heart rate, chest tightness, and dizziness, may preferentially trigger anxiety and distress for this group. Furthermore, given the higher rates of certain physical diseases within the group, it is plausible that a larger number of African Americans (relative to European Americans) have been directly exposed to these diseases via the illness and death of family members. Prior studies support the notion that exposure to chronic illness among family members may increase sensitivity to particular sensations associated with that illness (Ehlers, 1993). As a result, African Americans in the present study are expected to demonstrate heightened anxiety in response to a physical provocation relative to the other groups.

In line with our proposal, several previous studies have suggested that African Americans demonstrate a unique anxiety response to various physical symptoms. For instance, in an analysis of the Anxiety Sensitivity Index (ASI; Reiss, Peterson, Gursky, & McNally, 1986), a questionnaire that measures concerns about anxiety symptoms, Carter, Miller, Sbrocco, Suchday, and Lewis (1999) found that the three-factor structure for the questionnaire established with European American samples (physical concerns, mental incapacitation concerns, and social concerns) did not fit the data from an African American sample. Carter and colleagues found that the single physical concerns factor reported for other populations was better expressed as two separate factors in an African American sample: a cardiovascular concerns factor (e.g., “When I notice my heart beating rapidly, I worry that I might have a heart attack”) and an unsteady factor (e.g., “It scares me when I feel faint”). These results suggest African Americans may have independent categories of physical concerns as opposed to the unified dimension established with other groups. Furthermore, the cardiovascular concerns factor was particularly salient for African Americans; items from this factor were most highly correlated with total ASI scores. Thus, in addition to having a distinct structure of anxiety sensitivity, we might expect African Americans to exhibit more anxiety in response to cardiovascular stimuli, given the relatively strong relationship between cardiovascular concerns and anxiety sensitivity overall.

Additional studies suggesting differences in the underlying structure of anxiety for African Americans include findings of an increased tendency for this group to experience numbness and tingling sensations during anxiety (Smith et al., 1999) and a tendency to report more symptoms during a panic attack (Horwath et al., 1994) in comparison to European Americans. Also, studies indicate higher rates of comorbidity for isolated sleep paralysis (ISP), panic disorder, and hypertension (Neal, Rich, & Smucker, 1994) for African Americans. Given the reported link between these conditions (panic disorder and ISP) and hypertension, Neal and colleagues (1994) hypothesize that there may be a subset of African Americans whose anxiety is characterized by unique psychophysiological factors. Thus, we expect African Americans to respond with more anxiety to physical symptoms elicited in the context of anxiety provocations.

To investigate ethnic differences in anxiety following physical concerns and triggers, we examine anxiety in response to a physical provocation task that assesses individual sensitivity to shortness-of-breath symptoms. We hypothesize that African Americans will demonstrate greater anxiety than other groups on affective, behavioral, and cognitive measures after participating in this task.
Anxiety and Asian Americans: Focus on Interpersonal Concerns

Prior research with Asian American populations highlights the significance of social concerns in the construct of anxiety for this group. For the current study, Asian Americans are expected to demonstrate greater anxiety during a social interpersonal provocation. This hypothesis is partially based on Markus and Kitayama’s (1991) discussion of independent and interdependent self-construal to distinguish psychological processing in Western and non-Western ethnic groups. It is often noted that on average, Asian American culture emphasizes an interdependent construal of the self in which behavior is largely regulated by the thoughts and feelings of others in social relationships (Gatling, 1981; Lebra, 1976; Norasakkunkit & Kalick, 2002). In contrast, an independent self-construal in which independence and autonomy are more significant is primary for individuals from European ethnic groups. In an important study, Okazaki (1997) tested the role of self-construal in social anxiety with an Asian American and European American sample. Results indicated that Asian American participants, who reported a more interdependent self-construal, experienced greater levels of avoidance and distress in social situations and endorsed greater fear of negative evaluation relative to European American participants. Additional studies conducted with Asian American samples suggest increased emotional withdrawal, social isolation, verbal inhibition, and negative emotions during social situations for Asian Americans when compared to European American participants (Lee, Okazaki, & Yoo, 2006; Leong, 1986; Okazaki, 1997; Zane et al., 1991).

Furthermore, a Japanese form of social phobia known as *taijin kyofusho* (in which a core symptom is the fear that one will offend or make others uncomfortable) suggests that Asian Americans may be prone to experience anxiety in situations where proper public presentation of the self is emphasized. This is consistent with Asian cultural values that emphasize harmonious relationships and perhaps reinforce public self-consciousness, a construct that has been linked to social anxiety (Schlenker & Leary, 1982). Based on research indicating elevated concern for the thoughts, feelings, and actions of others in interpersonal contexts, Asian Americans in the present study are expected to experience higher levels of anxiety (relative to the other groups) during the social interpersonal provocation, where participants are asked to engage in conversation with a partner (who is intentionally apathetic to elicit social anxiety and possible fears of negative evaluation). Increased anxiety during the social interpersonal provocation for Asian Americans is expected to be evident across the different modes of assessment.

Although the primary hypothesis is that Asian Americans will demonstrate greater anxiety during the social interpersonal provocation in particular, findings from prior research do not clearly define the specific social situations that trigger more anxiety for Asian Americans relative to other groups. Therefore, it is also possible that Asian Americans will demonstrate more anxiety during a social performance provocation that requires participants to give an impromptu speech in front of a mirror with the experimenter watching (again in a somewhat aloof manner to elicit social anxiety). This alternative hypothesis follows from prior research indicating greater anxiety related to social introversion and feelings of inadequacy for Asian Americans relative to European Americans (Zane et al., 1991).

A third possibility follows from research suggesting that Asians are less likely than Western cultural groups to distinguish between emotional and physical problems, attributing both to
physiological imbalances (e.g., Arkoff, Thaver, & Elkind, 1966; S. Sue, Zane, & Young, 1994). In a study investigating beliefs about mental health problems, for example, Japanese Americans associated more external referent and somatic terms to the word depression, whereas European Americans associated terms that referred to internal mood states (Tanaka-Matsumi & Marsella, 1976). Accordingly, an alternative hypothesis in the present study is that Asian Americans might demonstrate greater anxiety during the physical (rather than only social) provocation. Whereas African Americans may report more anxiety in response to physical triggers, Asian Americans may report anxiety in terms of physical symptoms irrespective of the trigger (e.g., Asian Americans may indicate greater concern about throwing up or fainting when anxious). Taken together, the results of prior research investigating anxiety in Asian Americans offer several possibilities regarding the unique triggers of anxiety for this group. By including physical, social interpersonal, and social performance provocations, the current study provides an opportunity to tease apart the situational stimuli and appraisals that are predominant for Asian Americans.

Anxiety and European Americans: Focus on Performance and Autonomy Concerns

Studies investigating the relationship between ethnicity and psychopathology have frequently compared minority groups to European Americans, conceptualizing European Americans as the baseline ethnic group. Furthermore, although theories to explain the development and maintenance of psychopathology for non–European American groups are often based on cultural practices and beliefs, theories for European Americans are frequently discussed from an acultural perspective (S. Sue et al., 1994). A notable exception stems from the work of Markus and Kitayama (1991) and their delineation of independent and interdependent self-construal. As previously discussed, the concept of self-construal holds that on average, individuals from Western European and American ethnic groups have an independent self-construal, leading individuals to idealize independence and autonomy. Accordingly, personal attributes and abilities are considered to be the most significant factors regulating behavior.

The current study includes a European American sample in an effort to place the findings for this group in a cultural context. On the basis of research suggesting increased anxiety in situations challenging individual competency (Zeidner & Matthews, 2005), European Americans are expected to report higher levels of distress and anxious cognitions and display more avoidance (relative to the other groups) during a social performance provocation. Although the task includes a social component (the experimenter observes the participant during the speech), its purpose is to elicit concerns about negative evaluation of individual competence or performance based on the experimenter’s blank expression during the task. Given the importance of achievement and competence in European Americans’ independent self-construal, performance on this evaluative task is expected to be particularly anxiety provoking for this group.

Multimodal Assessment of Anxiety: Affect, Behavior, and Cognition

Following frequent findings of desynchrony across different measures of anxiety (see Lang, 1985), it is important to use multiple modes of assessment to obtain a comprehensive
picture of anxious responding. It is often the case that various anxiety indicators do not converge; however, each modality offers meaningful information about how individuals respond when anxious (Lang, 1985). Thus, we assess affective, behavioral, and cognitive indicators of anxious responding in the current study.

Moreover, ethnic characteristics may uniquely affect different modes of fear responding for diverse groups. For example, Okazaki, Liu, Longworth, and Minn (2002) found that Asian Americans reported more anxiety symptoms during an anxiety-provoking social performance task but did not demonstrate greater nonverbal behavioral indicators of anxiety (e.g., gaze avoidance and prolonged silences) relative to European Americans. Similarly, cultural values may make it more likely that a person will report anxious cognitions but be hesitant to express a desire to end an anxiety provocation prematurely (behavioral marker of anxiety). To our knowledge, this has not been empirically investigated but seems plausible, given prior research examining cultural influences on assertion and verbal inhibition (e.g., Zane et al., 1991). For example, in a study examining ethnic differences in self-reported assertiveness across a variety of situations presented on a questionnaire, Zane and colleagues (1991) found that Asian Americans reported less assertiveness than European Americans reported in situations involving strangers. In contrast, D. Sue, Ino, and Sue (1983) found no ethnic differences in assertiveness using behavioral role-plays. These discrepant findings may reflect the demand characteristics inherent in behavioral role-plays. Given the absence of research exploring the link between ethnicity and different modes of anxious responding, it is difficult to make specific predictions regarding how ethnic groups might express anxiety differently across modes in the present study. Thus, the multimodal assessment approach was considered critical to develop a fuller picture of anxious responding across ethnic groups, but particular ethnic group comparisons across modes are exploratory in nature.

To examine the unique triggers and anxiety responses in diverse populations, the current study investigates ethnic group differences in anxiety responses following three provocations designed to elicit specific ethnic values that may alter the experience and expression of anxiety.

**Method**

**Participants**

One hundred twelve students enrolled in psychology courses at the University of Virginia participated in the study to fulfill their research participation requirement. The average age for the sample was 18.9 (SD = 1.10, range = 17 to 22), and the average family income per year was $70,000 to $80,000 (SD = $30,000, range = less than $10,000 to more than $100,000). There were 39 African American (6 males, 33 females), 39 European Americans (14 males, 25 females), and 33 Asian American (13 males, 20 females) participants.1

The choice to use a young, nonclinical sample follows from the goal of investigating the link between cultural beliefs and anxiety during the critical time period when anxiety disorders often emerge. The age range for the current sample (17 to 22) represents the peak period of onset for several anxiety disorders, including panic disorder (Kessler et al., 1994). In addition, several of the primary studies reporting a relationship between ethnicity and anxiety were conducted with young, nonclinical samples (e.g., Carter et al., 1999; Zane et al., 1991), suggesting that it is useful to investigate ethnic differences in this population. Finally,
Sanders-Thompson (1994) found that respondents between the ages of 18 and 35 reported receiving higher rates of racial pride messages during their upbringing in comparison to respondents older than the age of 35, suggesting high levels of ethnic identity among younger populations. Thus, our young adult participants (African Americans and Asian Americans in particular) are expected to demonstrate emotional responding that is consistent with the values and behaviors associated with their respective ethnic group.

We recognize that each of the ethnic groups is characterized by considerable within-group heterogeneity that is potentially overlooked when subgroups are combined (this was necessary to recruit adequate sample sizes, particularly for Asian Americans). The grouping of all Asian American participants may, however, be theoretically supported by research indicating that various Asian cultures share common cultural values and practices, such as concern with saving face and an emphasis on group harmony (Ho, 1982). Furthermore, previous research suggests that although it is necessary to acknowledge and examine within-group differences, investigating average characteristics in between-groups ethnic comparisons may also yield meaningful findings (S. Sue et al., 1994).

**Experimenter characteristics.** To address potential effects of the experimenters’ and confederates’ ethnic background on participants’ anxiety, three experimenters conducted the investigation, one from each of the ethnic backgrounds of participants in the study (African American, Asian American, and European American). These experimenters also participated as the confederates for other participants (see “Social Anxiety Provocation: Interpersonal Concerns—Conversation” below). Counterbalancing was used to ensure that each experimenter conducted the study with approximately equal numbers of participants from each background (e.g., each of the three experimenters conducted the study with approximately 13 Asian American, 13 African American, and 13 European American participants). Similarly, each confederate participated in the experiment with 13 African American, 13 Asian American, and 13 European American participants.

Furthermore, to heighten the participants’ identification of the confederate as belonging to a particular ethnic group, confederates introduced themselves to the participant with a name that is commonly used in their respective ethnic group. The names of both the confederate and the participant were recorded on nametags that were worn throughout the conversation task. To check that participants identified the experimenter and confederate as belonging to a particular ethnic group, each participant completed an exit questionnaire where they reported the experimenter and confederate’s ethnicity. Mistakes in identifying the ethnicity of the experimenter or confederate were rare (less than 10% error rate).

**Materials**

**Measures of Anxious Responding**

**Behavioral avoidance and self-reported state anxiety.** Participants completed three behavioral avoidance tasks (BATs) that were designed to evoke mild to moderate levels of anxiety. When receiving the instructions for each task, participants were encouraged to end the task whenever they wished, to reduce the likelihood of coerced participation. Before starting each task (but after the task had been explained), participants were asked to provide an anticipatory rating of anxiety. The participant then completed the task for the allotted time...
or until he or she requested to stop. A participant’s request to terminate a task provided an indication of behavioral avoidance. When the task was over, participants provided a rating of their subjective anxiety at its peak during the task. Anxiety ratings were made using a verbal analog scale ranging from 0 to 100, with 0 representing *no anxiety* and 100 representing *maximum anxiety*.

**Physical anxiety provocation: Straw breathing (Taylor & Rachman, 1994).** Participants completed a widely used BAT designed to activate potential hypersensitivity to shortness-of-breath sensations. Participants were asked to breathe through a thin straw for up to 1 min, a harmless activity that does produce some very temporary dizziness and lightheaded feelings. This task is not in any way dangerous, though it may produce anxiety for persons who are prone to panic symptoms. Prior studies indicate that the straw-breathing task is effective at inducing physical symptoms and fear in both clinical and nonclinical samples (Antony, Ledley, Liss, & Swinson, 2006; Schmidt & Trakowski, 2004). Recall that African Americans were expected to experience greater anxiety (relative to both the other groups and the other tasks) in response to this BAT.

**Social anxiety provocation: Interpersonal concerns–Conversation (Taylor, Koch, Woody, & McLean, 1997).** In an effort to examine the social anxiety experienced as the result of interpersonal engagement, participants were asked to participate in a conversation with a stranger (whom they were told was completing the same study in a nearby room) for up to 4 min. Once the second participant entered the study room, he or she was told to participate in the conversation as if he or she were sitting at a bus stop waiting for the bus to arrive. The stranger in this case was actually a trained confederate who was trained to be somewhat cold and unengaging but not rude. The confederate offered minimal responses to the participant’s questions and initiated a maximum of only two questions throughout the task. These questions were only asked if there were periods of silence lasting at least 7 s (based on confederate’s estimation). Additional behavior guidelines for the confederate included minimal eye contact and very few encouraging bodily gestures, such as head nodding. The experimenter introduced the confederate and participant to one another and created nametags at the beginning of the task to increase the participant’s belief that the confederate was another participant (a check for suspicion about this deception was also included at the end of the study; see Procedures). The experimenter observed the conversation but did not offer comments or become involved in the interaction. Variations of this task have been widely used in prior studies to induce social interpersonal concerns with both clinical and nonclinical samples (e.g., Beidel, Turner, & Dancu, 1985; Edelmann & Baker, 2002; Marzillier, Lambert, & Kellett, 1976; Taylor et al., 1997; Turner, Beidel, & Larkin, 1986). Recall that Asian Americans were expected to experience greater anxiety (relative to both the other groups and the other tasks) in response to this BAT.

**Social anxiety provocation: Performance concerns—Speech (modified from McLean & Woody, 2001).** Participants were asked to complete a speech to evoke anxiety resulting from performance concerns. Inclusion of both the conversation and the speech allowed for differentiation of anxiety experienced primarily as a result of performance concerns and anxiety experienced mainly as the result of interpersonal engagement. Participants were asked to stand in front of a mirror and do an impromptu speech with the experimenter watching for up to 4 min. Participants were allowed to spend 1 min preparing; the topic was always
their initial impressions of college. They were instructed to stare at themselves in the mir-
ror for the duration of the speech to increase the likelihood of eliciting an anxiety response
(because of increased self-focused attention; Carver & Scheier, 1978). The experimenter
observed the speech from a chair placed approximately 1 ft (0.30 m) behind the participant
and maintained a blank facial expression throughout the task (to increase concerns about
potential negative evaluation). The speech provocation has been used frequently in the Trier
Social Stress Test (Kirschbaum, Pirke, & Hellhammer, 1993) and in prior studies assessing
social phobia (e.g., Hofmann, 2006; Mauss, Wilhelm, & Gross, 2003; Woody, 1996).
European Americans were expected to experience greater anxiety in response to this BAT
(relative to both the other groups and the other tasks).

Anxious cognitions. The Ethnic Variations in Anxious Cognition (EVAC; Gordon &
Teachman, 2004) is a nine-item questionnaire designed by the authors to measure cognitions
associated with state anxiety, analogous to the trait-based ASI. The scale includes a list of cog-
nitions, which address physical (e.g., “I might have a heart attack”), mental incapacitation (e.g.,
“I am going out of my mind”), and social concerns (e.g., “I am embarrassing myself”); the scale
was designed to capture the cognitions that are relevant for specific ethnic groups. To develop
the EVAC questionnaire, a list of 20 cognitions reflecting physical, mental incapacitation, and
social concerns was initially developed. In a subsequent study, factor analysis was used to val-
idate the EVAC as a measure of anxiety cognitions across groups using a sample of African
American, Asian American, and European American college students (Gordon & Teachman,
2004). The factor analysis was also conducted to retain the most meaningful items of the scale
that fit a comparable factor structure across groups, thereby reducing its length and permitting
application of the scale across ethnic groups. Results yielded the nine-item version of the scale
used in the present study. Participants completed the measure after each anxiety provocation.
EVAC scores were used to assess cognitions following each of the three anxiety provocations
(BATs listed above; Cronbach’s α = .77 for the current study).

Questionnaires: Mood and Symptom Measures

The following measures were included to examine baseline differences in anxiety and
depression symptoms.

ASI (Reiss et al., 1986). Each of the 16 items on the ASI, a questionnaire that measures
fear or concern about anxiety symptoms, is rated from 0 (very little) to 4 (very much) to
reflect concern about anxiety symptoms (e.g., “When I notice that my heart is beating
rapidly, I worry that I might have had a heart attack”). This measure has adequate psycho-
metric properties (Reiss et al., 1986; Cronbach’s α = .84 for the current study).

Beck Depression Inventory (BDI-II; Beck, Brown, & Steer, 1996). The BDI is a 21-item
well-established screening tool for depressive symptoms. This instrument has strong psy-
chometric properties, including good internal consistency (Beck et al., 1996; Cronbach’s α =
.90 for current study).

Fear of Negative Evaluation Scale–Brief Version (B-FNE; Leary, 1983; Watson & Friend,
1969). This scale is designed to assess concerns about negative interpersonal evaluation.
The brief version of the scale consists of 12 items (e.g., “When I am talking to someone, I worry about what they may be thinking about me”) scored on a 5-point Likert-type scale ranging from not at all characteristic of me to extremely characteristic of me. The scale typically has good reliability and validity (Watson & Friend, 1969), though Cronbach’s $\alpha = .66$ for the current study, which was somewhat low.

Social Avoidance and Distress Scale (SAD; Watson & Friend, 1969). The SAD is a widely used measure of social anxiety with good psychometric properties that assesses an individual’s tendency to avoid social situations and to feel anxious while in such situations. The questionnaire consists of 28 items, some of which are reverse scored (e.g., “It is easy for me to relax when I am with strangers”). Cronbach’s $\alpha = .94$ for the current study.

Ethnicity Measure
The Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992). The MEIM is a 15-item questionnaire that assesses the degree to which an individual identifies with his or her ethnic group. The measure comprises two factors: (a) ethnic identity search, which takes place over time as people explore and make decisions about the role of ethnicity in their lives, and (b) affirmation, which assesses an individual’s acceptance of and involvement in the social life and cultural practices of one’s ethnic group. It was hypothesized that ethnic identity would act as a moderator of the expected relationships between ethnicity and anxious responding. That is, individuals who reported stronger ethnic identity were expected to demonstrate the hypothesized relationships more strongly than those who reported lower levels of ethnic identity. Cronbach’s $\alpha = .67$ for the current study.

Procedure
Participants were told that the study was being conducted to measure emotional reactions to various tasks (no mention of ethnicity was made). Following informed consent, each participant provided a baseline rating of his or her anxiety using the 0-to-100 verbal analog scale. The order in which participants completed the two parts of the study (the questionnaires and the series of BATs) was counterbalanced to minimize order effects. The questionnaires were presented in a randomized sequence, and the three BATs (conversation, speech, and straw-breathing exposure) were counterbalanced. Following each BAT, participants reported their peak anxiety and completed the EVAC. After completion of the questionnaires and BATs, participants completed the MEIM and a questionnaire that assessed demographic information and participants’ beliefs about the ethnic background of the experimenter and confederate. Participants were then probed for suspicion regarding the social conversation with the confederate using a funneled debriefing protocol. Finally, participants were fully debriefed.

Results
Sample Characteristics: Demographic and Symptom Measures
To check for ethnic group differences in demographic characteristics, an ANOVA test was conducted. There were no significant age differences across the ethnic groups, $F(2, 91) = 0.77,$
Chi-square tests, however, indicated that there was a nonsignificant trend for a higher ratio of females to males among African Americans, $\chi^2 = 5.79, p = .06$. In addition, there were significant differences in family socioeconomic status (SES) across groups, $F(2, 109) = 9.02, p < .001, f = .41$. Scheffé post hoc tests indicated that European Americans reported significantly higher family SES (SES category, $M = $90,000 to $100,000 per year, $SD = 20$) than both African Americans ($M = $70,000 to $80,000 per year, $SD = 30; p = .01$) and Asian Americans ($M = $60,000 to $70,000 per year, $SD = 30; p < .001$) reported. Thus, SES and gender were used as covariates in relevant analyses because of an interest in examining differences in ethnic groups above and beyond these distinguishing demographic characteristics.

Means and standard deviations for the symptom measures (ASI, BDI-II, B-FNE, and SAD) are provided in Table 1 by ethnic group. On the basis of previous research indicating greater social anxiety and lower levels of assertiveness in Asian American college samples, Asian Americans were expected to demonstrate higher scores on the B-FNE and SAD (see Norasakkunkit & Kalick, 2002; D. Sue et al., 1983). Differences across groups were not expected on the BDI-II or ASI. Interestingly, ANOVA tests indicated significant group differences on the BDI-II, $F(2, 109) = 3.46, p = .04, f = .25$, and B-FNE, $F(2, 109) = 6.42, p < .001, f = .35$, and a nonsignificant trend on the SAD, $F(2, 109) = 2.83, p = .06, f = .23$, suggesting preexisting differences in anxiety and depression symptoms. Scheffé post hoc tests indicated that Asian Americans reported more depressive symptoms than African Americans on the BDI-II ($p = .04$), and there was a nonsignificant trend for European Americans to report more social avoidance and distress than African Americans on the SAD ($p = .06$). Last, Asian Americans reported higher fear of negative evaluation than African Americans on the B-FNE ($p < .001$).

### Table 1

| Symptom Measure | African American | | Asian American | | European American | |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                 | $M$  | $SD$ | $M$  | $SD$ | $M$  | $SD$ |
| ASI             | 33.23 | 8.21 | 34.85 | 9.74 | 33.99 | 8.52 |
| BDI-II          | 6.95$^a$ | 5.55 | 11.42$^b$ | 7.44 | 9.57$^{ab}$ | 8.65 |
| B-FNE           | 28.7$^{a}$ | 5.72 | 33.47$^{b}$ | 5.76 | 30.92$^{ab}$ | 5.94 |
| SAD             | 72.41 | 6.17 | 74.08 | 5.91 | 75.69 | 6.17 |
| MEIM            | 39.35$^a$ | 6.27 | 37.03$^a$ | 5.16 | 32.03$^b$ | 5.11 |

Note: ASI = Anxiety Sensitivity Index (Reiss, Peterson, Gursky, & McNally, 1986); BDI-II = Beck Depression Inventory–II (Beck, Brown, & Steer, 1996); B-FNE = Fear of Negative Evaluation–Brief Version (Leary, 1983); SAD = Social Avoidance and Distress (Watson & Friend, 1969); MEIM = Multigroup Ethnic Identity Measure (Phinney, 1992). Means in the same row with different superscripts differ at $p < .05$.

### Ethnic Group Differences in Anxiety Responses

Three overarching hypotheses guided the current study: (a) African Americans were expected to demonstrate more anxiety during the physical provocation than the other groups,
(b) Asian Americans were expected to demonstrate more anxiety during the social interpersonal provocation than the other groups, and (c) European Americans were expected to demonstrate greater anxiety during the social performance provocation relative to the other groups. The study included three anxiety provocations: (a) a physical anxiety provocation (breathing through a narrow straw), (b) a social anxiety provocation designed to trigger interpersonal concerns (conversation with a stranger), and (c) a social anxiety provocation designed to trigger performance concerns (speech in front of a mirror).

Three dependent variables were measured for each provocation. These measures included subjective anxiety ratings (affective), avoidance as indicated by a participant’s request to end a task (behavioral), and scores on the EVAC (cognitive). Examining the distribution of the variables indicated extreme skew and kurtosis for the EVAC cognition variables. Thus, the measure of anxious cognitions for each task was logarithmically transformed to normalize its distribution. In addition, the interaction between the EVAC subscales and ethnicity was not significant ($p > .10$), so we used the total EVAC score for all analyses. Figures 1, 2, and 3 illustrate ethnic group means on the affective, behavioral, and cognitive measures of anxiety across each of the anxiety provocations.
To investigate ethnic group differences in anxious responding across the provocations, a repeated measures MANOVA was conducted with one between-participants factor (ethnic group) and two within-participants factors, type of provocation (three levels) and type of anxiety response (three levels). Given the different measurement scales for each of the anxiety responses, $z$ scores were used. As expected, results yielded a significant three-way interaction between ethnicity, type of provocation, and mode of anxious responding, $F(8, 94) = 2.32, p = .02, f = .32$. Thus, univariate ANOVAs with post hoc Scheffé tests were conducted to evaluate the specific sources of the significant interaction.

Univariate ANOVA revealed a significant effect of ethnicity on behavioral avoidance, $F(2, 108) = 6.23, p = .003, f = .39$, for the physical provocation. Specifically, African Americans ($p < .001$) and European Americans ($p = .02$) both demonstrated greater behavioral avoidance than Asian Americans during this provocation. This result provides partial support for the hypothesis that African Americans would demonstrate more anxiety during the physical provocation relative to the other groups. Because there were ethnic group differences on gender and SES, the ANOVA was repeated with gender and SES as covariates. Results indicated that the effect of ethnicity on behavioral avoidance remained with these demographic variables held constant, $F(2, 88) = 4.99, p = .01, f = .33$.

Figure 2
Anxious Cognitions Following Each Anxiety Provocation by Ethnic Group

Note: EVAC = Ethnic Variations in Anxious Cognition (Gordon & Teachman, 2004). Group mean (and SE bar) for scores on the EVAC questionnaire (anxious cognitions) following the physical, social interpersonal, and social performance provocations. Higher numbers indicate a higher number of reported cognitions.
Figure 3
Peak Anxiety During Each Anxiety Provocation by Ethnic Group

Note: Group mean (and SE bar) for peak anxiety ratings (affective) during the physical, social interpersonal, and social performance provocations. Higher numbers indicate a higher level of reported anxiety (0-to-100 scale).

In addition, results revealed a nonsignificant trend for the effect of ethnicity on anxious cognitions during the social performance provocation, $F(2, 105) = 2.74, p = .07, f = .29$. Interestingly, the ANOVA with anxious cognitions as the dependent variable was significant when conducted with gender and SES as covariates, suggesting that these demographic differences may have partially masked the ethnic group differences, $F(2, 86) = 3.38, p = .04, f = .27$. Follow-up tests indicated that Asian Americans reported a higher number of anxious cognitions than African Americans ($p = .03$) during this provocation. These results again provide partial support for the hypotheses. On one hand, evidence for higher social concerns was observed for Asian Americans (though on the speech task rather than the conversation), but no support was found for the hypothesis that European Americans would demonstrate more anxiety in response to the social performance provocation.

There were no ethnic group differences for the social interpersonal provocation (all $ps > .10$). To assess participants’ knowledge of the confederate during this provocation, a funnelled debriefing protocol was completed at the end of the study during which participants reported suspicions about the study. To examine between-groups differences in the number of participants who reported suspicions regarding the confederate, a chi-square analysis of
the yes–no responses was conducted. Results did not reveal group differences for this question, \( \chi^2 = 2.37, p > .10 \); only 4 participants indicated knowledge about the confederate during this initial probe. The ANOVA for this task was then rerun excluding these 4 participants, but results did not change substantially (ethnic group differences remained nonsignificant).

### Within-Group Differences in Response to Anxiety Provocations

The study design allowed us to investigate not only between-groups differences in anxiety responding but also within-group differences in the tendency to respond with anxiety to different kinds of provocations: physical, social interpersonal, and social performance. A repeated measures MANOVA with two within-participant factors (type of provocation and type of anxiety response) was used to evaluate whether each group responded with more anxiety to one provocation versus another. The dependent variables were again the affective response (peak anxiety ratings), behavioral avoidance, and cognitions (measured by the EVAC).

The within-group MANOVA results for African Americans, \( F(4, 34) = 1.53, p > .10, f = .18 \), and for European Americans, \( F(4, 30) = 0.56, p > .10, f = .08 \), were not significant, suggesting no interaction between type of provocation and mode of anxiety response. However, results revealed a significant interaction, \( F(4, 29) = 4.79, p = .04, f = .46 \), for Asian Americans. Follow-up univariate analyses indicated a significant effect for type of anxiety provocation on peak anxiety ratings: affective, \( F(2, 37) = 13.67, p = .001, f = .35 \); behavioral avoidance, \( F(2, 31) = 19.26, p < .001, f = .55 \); and anxious cognitions, \( F(2, 31) = 4.08, p = .01, f = .32 \). For all three modes of anxious responding, pairwise comparisons revealed that Asian Americans responded with higher anxiety ratings on the social performance provocation relative to the physical and social interpersonal provocations (all \( p < .05 \)). Overall, these results are consistent with results from the between-groups comparisons indicating more anxiety for Asian Americans on the social performance provocation. Although the findings do not support the hypothesis that Asian Americans would demonstrate more anxiety in response to the social interpersonal provocation, they suggest heightened anxiety in response to certain social triggers among Asian Americans.

### Individual Differences as a Moderator of Anxious Responding

To assess the moderating effects of ethnic identity and gender, the repeated measures MANOVAs examining between-groups and within-group differences on type of provocation and mode of anxious responding were rerun with either the MEIM or gender included in the models. Surprisingly, the MEIM (see Table 1 for group means) was not a significant predictor in any of the analyses (all \( p > .10 \)), suggesting that ethnic identity did not moderate anxious responding in the current study. In addition, there was no significant Ethnicity \( \times \) Gender interaction, \( F(18, 148) = 0.79, p > .10, f = .10 \).

### Relationships Across Modes of Anxious Responding

Given the common finding of desynchrony across measures of anxiety, it is interesting to examine the relationship between the affective, behavioral, and cognitive anxiety markers (see Table 2). Results indicated that correlations among the affective measures across the three tasks (e.g., correlations between the affective measures for the physical, social interpersonal,
**Table 2**

**Correlations Among Affective, Behavioral, and Cognitive Measures**

<table>
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<tbody>
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<td>—</td>
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<td>—</td>
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<tr>
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<td>—</td>
<td>.45**</td>
<td>.11</td>
<td>.25**</td>
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<tr>
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<td>−.10</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Social: Interpersonal: B</td>
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<td>.03</td>
<td>.52**</td>
<td>.49**</td>
<td>−.28**</td>
<td>—</td>
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<tr>
<td>Social: Interpersonal: C</td>
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<td>.16</td>
<td>.25**</td>
<td>.66**</td>
<td>−.04</td>
<td>.40**</td>
<td>—</td>
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<tr>
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<td>.27**</td>
<td>−.18</td>
<td>−.06</td>
<td>.34**</td>
<td>−.09</td>
<td>−.12</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Performance: B</td>
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<td>−.02</td>
<td>.51**</td>
<td>.42**</td>
<td>−.09</td>
<td>.68**</td>
<td>.48**</td>
<td>−.21*</td>
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Note: A = affective; B = behavioral; C = cognitive.

*p < .05. **p < .01.
and social performance tasks) were moderate and significant. The same was true for the correlations among the cognitive measures. Correlations among the behavioral measures across the three tasks were small but also significant.

The study design also allowed us to examine the relationship between the various modes of anxious responding within each task. For the physical provocation, the correlation between the affective and cognitive measure was moderate and significant. In contrast, correlations between the behavioral avoidance measure and both the affective and cognitive measure were weak and not significant. This pattern of relationships was also observed for the social performance provocation. In contrast, for the social interpersonal provocation, the relationship between the behavioral and cognitive measure was negative and small but significant. Overall, the pattern of results across tasks reflects relatively weak relationships between the behavioral measures and both the affective and cognitive measures. The affective and cognitive indicators share some method variance in that both are based on self-report, but this is unlikely to fully explain the relationship, given that one required a verbal rating whereas the other reflects endorsement on a written questionnaire.

**Discussion**

This study examined ethnic differences in the level of subjective distress, anxious cognitions, and behavioral avoidance that characterize the experience of anxiety following a series of provocations. It was hypothesized that African Americans would demonstrate heightened anxiety during the physical provocation. Asian Americans were expected to demonstrate greater anxiety during a social interpersonal provocation, and European Americans were expected to evidence greater anxiety during a social performance provocation.

Findings revealed interesting between-groups and within-group differences in anxious responding. African Americans and European Americans demonstrated higher levels of behavioral avoidance than Asian Americans during a physical provocation designed to assess individual sensitivity to physical symptoms, such as dizziness and shortness of breath. Furthermore, after accounting for gender and SES group differences, Asian Americans reported more anxious cognitions than the other groups during the social performance provocation. Within-group analyses revealed that Asian Americans demonstrated greater affective, behavioral, and cognitive anxiety responses to the social performance provocation relative to the physical and social interpersonal provocations. Interestingly, level of ethnic identity did not appear to moderate these findings. Taken together, these results suggest an intriguing but complex pattern for ethnic differences in anxious responding that do not neatly align with simple distinctions among type of provocation or mode of response.

**Implications for Theories of Ethnic Differences in Anxiety**

**African Americans.** Findings for African Americans provide partial support for the hypothesized patterns and are consistent with Carter and colleagues’ (1999) observation that African Americans may experience unique physical concerns related to anxiety (i.e., African Americans demonstrated greater anxious avoidance on this task than did Asian Americans). Furthermore, the findings provide partial support for the theoretical proposal that African Americans may experience a unique vulnerability to cues of physical illness.
This proposal was adapted from the model of healthy cultural paranoia, which suggests that higher base rates of a phenomenon, such as experiences of racism (certain physical illnesses in the current study), lead to heightened vigilance for instances of the phenomenon. In this case, African Americans demonstrated greater anxiety in response to shortness of breath, dizziness, and lightheaded sensations, suggesting a possible vulnerability to illnesses marked by these symptoms (e.g., hypertension). It should be noted, however, that whereas African Americans were expected to demonstrate greater sensitivity to physical symptoms relative to European Americans, the current findings suggest anxious responding for these two groups was more similar (with differences existing between African Americans and Asian Americans). This may reflect the need to explore a wider variety of physical symptoms to assess the sensations that are uniquely relevant for African Americans. Based on the findings of Carter and colleagues, who found a stronger relationship between anxiety and cardiovascular concerns (relative to unsteady concerns) for African Americans, future studies might fruitfully incorporate a provocation that elicits increased heart rate to activate specific physical concerns that are dominant for African Americans. Overall, the current findings offer a first step toward understanding differences in physical sensations reported in high-anxiety African American populations, and adapting the model of healthy cultural paranoia to reflect cultural differences in anxiety and illness concerns may help the field develop a theoretical framework to guide future research in this area. The present study was not designed to directly test this model, so explicitly manipulating anxiety and illness concerns will be an important next step.

As for Asian Americans, prior research emphasizes a cultural emphasis on the thoughts and feelings of others in social relationships that is consistent with an interdependent (as opposed to independent) self-construal (Markus & Kitayama, 1991). Contrary to our hypotheses, results indicated that Asian Americans reported more anxious cognitions during the social performance provocation relative to the other groups and to the other provocations (on the basis of within-group analyses). Though the performance task included a social component (experimenter observed the participant), it was hypothesized that Asian Americans would demonstrate more anxiety during the social interpersonal task, because this provocation involved direct interpersonal interaction.

Markus and Kitayama (1991) provide a possible explanation for these findings in their analysis of interdependent self-construal, wherein it is argued that a focus on maintaining balance in interpersonal relationships may be limited to in-group members. That is, individuals from interdependent cultures may organize their behavior around the thoughts, feelings, and actions of others when the interaction involves those tied to the same lasting social unit. Thus, the social interpersonal provocation may not have elicited higher levels of anxiety for Asian Americans because the participant and the confederate did not share a “common fate” (Markus & Kitayama, 1991, p. 229) in that they did not have the same cultural background. To partially investigate this possibility, we analyzed anxious responding for Asian American participants when the confederate was also Asian American. Interestingly, results indicated that Asian Americans reported significantly higher peak anxiety ratings and a greater number of anxious cognitions when the confederate was Asian American relative to when the confederate was African American. These findings provide support for Markus and Kitayama’s position and
highlight the potential importance of in-group/out-group distinctions in understanding social concerns that may be unique to Asian Americans.

It is also interesting to note that Asian Americans did not demonstrate greater anxiety during the physical provocation based on between-groups or within-group comparisons. Although not directly comparable, this result does not match reports suggesting that Asian Americans tend to demonstrate strong associations between emotional and physiological difficulties (S. Sue et al., 1994). These findings may suggest a need to further investigate the reasons for the oft-reported tendency for Asian Americans to seek mental health treatment from medical service providers as opposed to mental health professionals (Arkoff et al., 1966).

European Americans. Results did not support the prediction that European Americans would demonstrate greater anxiety during the social performance provocation. Instead, European Americans exhibited greater anxious avoidance on the physical provocation than did Asian Americans. This may reflect European Americans’ greater ease with expressing discomfort and requesting to terminate the task prematurely relative to Asian Americans. There is some evidence that European Americans may be more apt to demonstrate assertiveness in role-plays relative to Asian Americans (e.g., D. Sue et al., 1983; Zane et al., 1991). This finding further emphasizes the importance of examining anxious responding across various modes of responding.

Limitations and Conclusion

Several limitations of the present design should be addressed. First, participants from a variety of Asian American backgrounds were grouped together, limiting our ability to evaluate the link between culture and anxiety in specific subcultures. Second, power is always a concern when a study has some critical null findings. However, a number of hypothesis-driven ethnic group differences were observed, and the sample size for the current study was not particularly small (34 to 39 per group) and was comparable to similar studies in this field. Third, the current findings are limited in their generalizability to clinical and perhaps community populations. Notwithstanding, our Asian American and African American participants did report levels of ethnic identity consistent with levels previously reported in community samples (e.g., Sherry, Wood, Jackson, & Kaslow, 2006; Utsey, Chae, Brown, & Kelly, 2002). Finally, the study was limited in the number of behavioral tasks used as anxiety provocations. The inclusion of only one provocation for each hypothesis may have constituted a conservative test of ethnic differences in the triggers of anxiety. For example, including several interpersonal provocations with a variety of situational demands (e.g., a situation requiring assertiveness or including an authority figure) may more accurately reflect the concerns unique to each ethnic group.

Nevertheless, the present study demonstrates interesting differences in the anxious responding of different ethnic groups following a variety of provocations. The current study was unique in its use of a multitrait, multimodal design. Including behavioral tasks that reflect hypothesized areas of concern for each of the ethnic groups allowed for specific hypotheses regarding fear responding for each group. In addition, the use of affective, behavioral, and cognitive measures of anxiety provided a comprehensive assessment of anxiety responses. Although future research is needed, the current findings provide an early
step toward understanding the ways in which the underlying structure of anxiety may differ across groups. The study provides further support for the growing recognition that culture and ethnic background are key to understanding the complexity of emotional dysregulation.

Notes

1. The majority of the participants from Asian American backgrounds reported their ethnicity as Asian American; however, several participants reported a specific cultural background (i.e., 12 Chinese, 6 Korean, 1 Japanese, and 4 Indian).
2. The Self vs. Other Focused Attention Scale (Chambless & Glass, 1984) was included as an exploratory measure to examine the influence of focused attention on group differences, which is not reported here. In addition, the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) was used to evaluate the automatic meaning of anxiety for different groups. However, a significant amount of IAT data was lost because of administrator error, precluding a valid interpretation of the results.
3. A one-way ANOVA examining the effect of the confederate’s ethnicity on the three modes of anxious responding during the social interpersonal provocation revealed a significant effect of the confederate’s ethnicity on peak anxiety ratings, $F(2, 30) = 4.08, p = .03, f = .62$, and anxious cognitions, $F(2, 30) = 5.71, p = .01, f = .52$, for Asian Americans. Scheffé post hoc tests indicated that Asian Americans reported higher peak anxiety ratings and more anxious cognitions when the confederate was Asian American (peak anxiety ratings, $M = 40.74, SD = 22.15$; anxious cognitions, $M = 3.49, SD = 0.39$) relative to African American (peak anxiety ratings, $M = 34.36, SD = 20.19$; anxious cognitions, $M = 3.11, SD = 0.19$).

References


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