Published in final edited form as:

J Anxiety Disord. 2010 December ; 24(8): 873–878. doi:10.1016/j.janxdis.2010.06.010.

The Experience of Panic Symptoms across Racial Groups in a Student Sample

Terri L. Barrera, Kathryn P. Wilson, and Peter J. Norton

University of Houston

Abstract

While there is general agreement that, across cultures, panic disorder appears to be characterized by sudden onset of bodily sensations, such as dizziness and heart palpitations, followed by catastrophic misinterpretations of these symptoms, there remains a need for research investigating ethnic/cultural differences in the experience of panic attacks. In addition to investigating ethnic differences in the experience of panic, it is important to assess whether increased endorsement of panic symptoms translates into increased dysfunction. The present study investigated differences in the experience of panic attacks and examined the relation between symptom endorsement and overall distress and impairment in a large multiracial/ethnic student population. Preliminary analyses indicated that although overall endorsement of panic symptoms was similar across groups, differences did emerge on specific symptoms. Participants identifying as Asian tended to endorse symptoms such as dizziness, unsteadiness, choking, and feeling terrified more frequently than those identifying as Caucasian, and individuals identifying as African American reported feeling less nervous than those identifying as Caucasian. Participants of Hispanic/Latino(a) descent showed no differences from any other group on symptom endorsement. Panic symptom severity was not found to differ across racial/ethnic groups; however, the correlation between panic symptoms and panic severity was stronger for Asian and Caucasian participants than for African Americans. These results suggest that symptoms of panic may be experienced differently across racial/ethnic groups, and highlight the need for clinicians and researchers to assess panic symptoms within the context of culture.

Cross-cultural research has demonstrated that the experience of anxiety is universal (Good & Kleinman, 1985). However, anxiety occurs in the context of culture, and, as such, culture plays a key role in shaping the experience of anxiety by dictating the language individuals use to describe anxiety and by determining the meaning and importance of particular symptoms. Several researchers have suggested that culture shapes the experience of panic by influencing the sensations that become the focus of concern and influencing the catastrophic misinterpretations of those sensations (e.g. Hinton, Hofmann, Pitman, Pollack, & Barlow, 2008; McNally, 2008). While there is general agreement that, across cultures, panic disorder appears to be characterized by sudden onset of bodily sensations, such as dizziness and heart palpitations, followed by catastrophic misinterpretations of these symptoms, there remains a need for research investigating ethnic/cultural differences in the phenomenology of panic attacks.

The experience of orthostatic panic among Cambodian refugees provides one of the more striking illustrations of culture shaping the phenomenology of panic. Large numbers of Cambodian refugees have reported terror secondary to dizziness upon standing (Hinton et al.,

2008; McNally, 2008). An understanding of the manner in which the Cambodian culture conceptualizes physiology clarifies why catastrophic misinterpretations of dizziness may trigger panic for some Cambodian refugees. According to the Cambodian belief, a wind-like substance (*khyâl*) moves through the circulatory system; standing up may cause “*khyâl* overload”, or an upsurge of *khyâl* and blood that could lead to asphyxia, neck vessel rupture, loss of consciousness, or death. Whereas many contemporary Westerners may be likely to interpret dizziness as signals of impending heart attack or stroke, these Cambodian refugees interpreted orthostatic dizziness as a signal of a potentially fatal *khyâl* overload.

In addition to fears related to wind blockage, fears of disrupting the yin-yang balance may underlie other frequently reported panic symptoms for some individuals from Asian cultures. *Pa Leng* represents one such syndrome experienced by some members of Chinese cultures. Individuals suffering from *Pa Leng* often present with cold, clammy hands, tachycardia, dry mouth and other somatic symptoms that trigger panic due to beliefs that these sensations are likely to represent signals of a potentially fatal upset in the balance between yin and yang (Good & Kleinman, 1985).

Ataques de nervios represent a culturally appropriate expression of distress for some individuals within Puerto Rican culture. *Ataques de nervios* are characterized by an overall sense of being out of control and have been described as “dramatic episodes in which the person trembles, begins to shout, sometimes becomes verbally and physically aggressive, and experiences heat in the chest that rises to the head” (Cintrón, Carter, & Sbrocco, 2005, p. 416). Despite considerable symptom overlap, whether *ataques de nervios* should be considered panic attacks has been the subject of much debate; however, evidence suggests that for individuals who meet criteria for panic disorder, *ataques de nervios* consist mostly of panic-like symptoms (Liebowitz, Salmán, Jusino, & Garfinkel, 1994; Guarnaccia, Canino, Rubio-Stipec, & Bravo, 1993; Guarnaccia, Rivera, Franco, & Neighbors, 1996; LaBruzza & Méndez-Villarrubia, 1994).

Another important aspect in the study of panic phenomenology across cultures is whether variations in symptom presentation exist among ethnic groups within the United States. Research has demonstrated that individuals who identify as African American may report different panic symptoms than individuals who identify as European American (Carter, Miller, Sbrocco, Suchday, & Lewis, 1999). Analysis of data from the Epidemiological Catchment Area study (Eaton & Kessler, 1985) revealed that, for individuals who identify as African American, tingling in the hands and feet and hot/cold flashes may be particularly related to panic attacks (Horwath, Johnson, & Horing, 1994). Similarly, Smith, Friedman, and Nevid (1999) found that individuals who identify as African American were more likely to experience tingling sensations and numbness in their extremities, as well as fears of dying or going crazy during panic attacks than individuals who identify as European American. It has been suggested that tingling and numbness in the extremities may be of particular concern for individuals identifying as African American due to the high rates of diabetes, hypertension, and foot amputations within this group (Friedman & Paradis, 2006). These authors further speculate that individuals identifying as African American may be fearful of “going crazy” because they are afraid of potential negative consequences. Indeed, research documenting that African Americans with panic disorder are more likely to be misdiagnosed with a serious mental illness and subsequently hospitalized in inpatient facilities (Friedman & Paradis, 1991), highlight the reality underlying these fears. Socioeconomic status may also be linked to the fear of these negative consequences, as African Americans of lower SES have a high rate of exposure to violence as well as less trust in authority and the health care system (Friedman & Paradis, 2006).

Additionally, Hispanic Americans tend to endorse more somatic symptoms than their Caucasian American counterparts (Canino, 2004). For instance, individuals identifying as Caucasian-Hispanics living in New Mexico have reported more frequent somatic anxiety symptoms such as pounding heart, chest pain or discomfort, and muscular pains or aches in comparison to individuals identifying as Caucasian-Non-Hispanics (Hollifield, Finley, & Skipper, 2003). This may be due to the greater acceptance of somatic or physical ailments in Hispanic culture as opposed to psychological problems (Varela et al., 2004). Investigations into the experience of panic symptoms in individuals identifying as Asian-American are regrettably scant. In the sole study of cultural differences in panic symptoms including Asian-Americans that we are aware of, Asnaani and colleagues (2009) failed to find expected panic symptom profiles for this group, such as increased endorsement of dizziness.

In addition to investigating ethnic differences in the experience of panic, it is important to assess whether increased endorsement of panic symptoms translates into increased dysfunction. Good and Kleinman (1985) point out that a common, but flawed, assumption in cross-cultural research is that increased symptom quantity and intensity translates into increased pathology. In essence, it is often assumed that when increased endorsement of specific symptoms is related to increased impairment in one cultural group, this association occurs in a similar manner in other cultural groups. As noted by Washington, Temple, and Norton (2008) in reference to obsessive-compulsive symptoms:

much of the world might consider North Americans to be compulsive washer/cleaners, as it is not uncommon to bathe or wash 1 or more times per day, hand wash several more times throughout the day, and commonly use sanitary hand-wipes or gels. And yet, it clearly would not be appropriate to pathologize entire nations as having a washing/cleaning variant of OCD, as these behaviors are considered appropriate, if not encouraged, within the North American culture (p. 457).

While studies investigating whether increased symptom endorsement in panic disorder translates to increased impairment and distress are lacking, at least one study has investigated these relations in obsessive-compulsive disorder. The aforementioned Washington et al. study described a multiracial/ethnic analysis of obsessive-compulsive symptoms in a student sample. Results suggested that while students identifying as Southeast and South Asian/East Indian reported significantly more symptoms than students who identified as African American, Caucasian, or Hispanic/Latino, only students who identified as South Asian/East Indian reported a correspondingly high level of distress and interference due to those symptoms. This indicates that, for individuals of Southeast Asian descent, increased endorsement of behaviors on common measures of OCD was not associated with increased pathology.

Investigations of panic disorder have noted cultural differences in symptom endorsement but have not taken the next step towards elucidating how this relates to dysfunction. For example, Horwath et al. (1994) found that, compared to individuals identifying as European American, individuals identifying as African American reported a greater number of symptoms during full-blown panic attacks. What is not known, however, is whether this greater number of symptoms translates into greater impairment and distress. Additionally, Cintrón et al. (2005) found that individuals experiencing *ataques de nervios* did not exhibit the avoidance that characterizes panic disorder; it is unknown whether this reduced avoidance is an indication that *ataques de nervios* leads to less impairment than panic attacks in other cultural groups. Similarly, Hollifield and colleagues found that self-identified Caucasian-Hispanics tended to perceive panic attacks as more serious than those identifying as Caucasian-Non-Hispanic, yet were less pessimistic about the potential consequences of panic attacks.

The present study seeks to explore and describe phenomenological differences in panic disorder among ethnic/racial groups in a large student sample. Additionally, this study will investigate

the relation between common panic symptoms and self-reported dysfunction across ethnic/racial groups. Previous studies have generally neglected to assess this important relationship, and questions remain as to whether high rates of symptomology confer similar increases in impairment and distress across ethnic/racial groups. Although it is ideal to account for cross-cultural variability by investigating acculturation and assimilation among various ethnic/racial groups, the present study aims to examine the psychometrics of self-report measures at the level of broad categories of race and ethnicity, as this is the primary information available to most clinicians and researchers.

Method

Participants

The sample consisted of 922 undergraduate students attending the University of Houston. Participants ranged in age from 17 to 59 ($M = 21.88$, $SD = 4.91$), and were predominately female (75.3%). Of the total sample, 21.9% were freshmen, 22.7% were sophomores, 29.3% were juniors, and 25.2% were seniors. The sample was racially diverse (30.0% Caucasian, 26.8% Asian American, 22.6% Hispanic, 20.6% African American).

Measures

All participants completed the Panic Disorder Severity Scale and the Beck Anxiety Inventory as part of a larger self-report assessment battery.

Panic Disorder Severity Scale—The Panic Disorder Severity Scale (PDSS; Houck, Spiegel, Shear, & Rucci, 2002; Shear et al., 1997) is the gold standard for assessing the overall severity of panic disorder. Modeled after the Yale-Brown Obsessive-Compulsive Scale (YBOCS; Goodman et al., 1989a, 1989b), the PDSS evaluates the following seven domains: frequency of panic attacks, distress during panic attacks, anticipatory anxiety, agoraphobic fear/anxiety, interoceptive fear/anxiety, impairment of work functioning, and impairment of social functioning. The PDSS has seven items rated on an ordinal scale ranging from 0 to 4, resulting in a maximum total score of 28. The PDSS has been used in cross-cultural research and has been translated into several languages. The original English version has demonstrated unidimensionality (Shear et al., 2001); the one-factor model was replicated with the Japanese version of the PDSS (Yamamoto et al., 2004). However, studies using the PDSS with Turkish and Korean samples have found evidence for a two-factor model, with one factor (the panic attack factor) containing the frequency and distress items, and the second factor (symptoms and signs secondary to panic) containing the remaining five items (Monkul, Turnal, Onur, Fidanar, Alkin, & Shear, 2004; Lim, Yu, & Kim, 2007). To our knowledge, psychometric estimates for the PDSS have not yet been obtained from African American or Hispanic samples. Although originally developed as a clinician administered measure (Shear, et al., 1997), the self-report version developed by Houck and colleagues (2002) was used in this study. The self-report version of the PDSS has previously shown excellent test-retest reliability ($ICC=0.81$) and internal consistency ($\alpha = .92$; Houck et al., 2002).

Beck Anxiety Inventory—The Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988) is a 21-item self-report measure designed to assess the severity of general anxiety symptoms. Each item describes a common anxiety symptom, and respondents are asked to rate the degree to which they have been bothered by the symptom over the previous week on a scale from 0 (not at all) to 3 (severely). Total scores on the BAI range from 0 to 63. The BAI has been shown to be psychometrically sound in non-clinical samples of undergraduate students (see Creamer, Foran, & Bell, 1995). Although the BAI was originally intended to measure general anxiety symptoms, some researchers have suggested that the BAI may be better suited to measure symptoms of panic (Cox, Cohen, Dorenfeld, & Swinson, 1996). In fact, examination

of the BAI items shows that they very closely resemble the symptoms of panic listed in the DSM-IV. A recent factor analysis of anxiety disorder symptom measures (Norton, 2006) found that all BAI items loaded together with PDSS items on a single panic factor, with only items assessing inability to relax, fear of the worst happening, and nervousness also cross-loading on a factor comprised of items from measures assessing generalized anxiety. Therefore, the BAI will be used as a measure of panic symptomatology in the current study.

Procedure

Data from the current study were collected as part of a larger assessment of anxiety in undergraduates at the University of Houston. Participants were recruited from an undergraduate psychology subject pool, and received extra coursework credit for their participation. The Institutional Review Board of the University of Houston reviewed all methods and procedures, and all participants provided informed consent. Participants completed the questionnaires online or on paper, and returned the paper questionnaire packets to the researchers within one week.

Results

Descriptive data

Preliminary analyses indicated some differences in demographic characteristics across racial groups. Participants of Caucasian descent were significantly older ($M = 23.26$, $sd = 5.89$) than were participants of African American ($M = 21.95$, $sd = 5.96$), Hispanic ($M = 21.45$, $sd = 3.40$), or Asian descent ($M = 20.66$, $sd = 3.29$), $F(3, 912) = 13.34$, $p < .001$, partial $\eta^2 = .04$. Additionally, African American participants were more likely to be female (81.9%) whereas Asian participants were less likely to be female (71.1%), $\chi^2(3, n = 918) = 7.94$, $p = .047$. However, no differences in any subsequent statistical results were noted when age and sex were included as covariates. Finally, participants completing the measures online did report higher PDSS ($M = 4.13$, $sd = 5.44$) and BAI scores ($M = 12.96$, $sd = 12.01$) than did those completing the measures via paper and pencil (PDSS: $M = 2.72$, $sd = 4.00$; BAI: $M = 9.43$, $sd = 8.75$), $F(2, 919) = 13.78$, $p < .001$, partial $\eta^2 = .03$, although these differences accounted for less than 3% of the variability. Inclusion of administration format as a covariate did not influence the results any of the subsequent analyses.

Internal consistency was high in the current sample for both the PDSS ($\alpha = .915$) and BAI ($\alpha = .935$). Total scores of the PDSS ranged from 0 to 28 with a mean of 3.24. BAI total scores ranged from 0 to 63 with a mean of 10.73. Table 1 shows means and standard deviations of PDSS and BAI total scores, as well as BAI item level data by race. Based on item #1 of the PDSS (past month frequency of panic attacks), 33.1% of the sample reported having what they experienced to be a panic attack; similar self-reported rates of panic attacks among student and non-clinical samples have been reported previously (e.g., Norton, Harrison, Hauch, & Rhodes, 1985; Norton, Dorward, & Cox, 1986).

Panic Severity

An ANOVA was used to investigate potential differences in panic severity across racial groups. PDSS total scores were entered as the dependent variable with race (Caucasian, African American, Hispanic, and Asian) as the between-subjects factor. Results indicated a non-significant effect of race on total PDSS scores [$F(3, 919) = 1.06$, $p = .364$].

Panic Symptoms

To compare the endorsement of panic symptoms across racial groups, an ANOVA was conducted. BAI total scores were entered as the dependent variable with race (Caucasian,

African American, Hispanic, and Asian) as the between-subjects factor. Results indicated a non-significant effect of race on overall total BAI scores [$F(3, 918) = 1.42, p = .236$].

Although there were no differences found in total BAI scores, the question remains as to whether members of different racial/ethnic groups in the United States experience specific panic symptoms to varying degrees. For instance, previous research has indicated that Hispanic Americans may endorse more somatic symptoms than Caucasian Americans (Hollifield, Finley, & Skipper, 2003). Therefore, a Multivariate ANOVA was conducted to test whether significant main effects of race were present on each symptom assessed by the BAI. The overall multivariate effect of race was significant, $F(63, 2607) = 2.11, p < .001$. Univariate follow-up analyses found significant main effects of race were found for the panic symptoms of feeling dizzy [$F(3, 917) = 3.95, p = .008$], unsteady [$F(3, 916) = 4.01, p = .007$], terrified [$F(3, 915) = 3.93, p = .008$], nervous [$F(3, 915) = 3.69, p = .012$], feelings of choking [$F(3, 916) = 3.56, p = .014$], and face flushed [$F(3, 912) = 5.13, p = .002$]. Bonferroni-corrected post hoc tests revealed that individuals identifying as Asian scored significantly higher on items assessing dizziness and unsteady feelings than did individuals identifying as either African American or Caucasian, and also scored significantly higher than individuals identifying as Caucasian on items assessing symptoms of being terrified and feelings of choking. Conversely, individuals identifying as African American scored significantly lower on the item assessing nervousness than did individuals identifying as Caucasian, and also scored significantly lower on the item assessing flushness of the face in comparison to individuals identifying as either Caucasian or Asian.

Relationship between Panic Symptoms and Distress

Although individuals identifying as Asian generally reported higher levels of symptoms, it is not necessarily given that such increased symptomology is indicative of increased pathology. Fisher Z-tests were used to test the relationship between panic symptoms and self-reported distress and impairment. Pearson correlations were separately computed between the BAI and PDSS total scores for each ethnic/racial group and then transformed into Z-scores (Table 2). The magnitudes of these correlations were compared across groups using Fisher Z-test of independent-sample correlations. Results indicated that participants identifying themselves as African American tended to show a weaker relationship between measures of panic symptoms and panic severity than did participants identifying themselves as Caucasian ($Z = 2.04, p = 0.021$) or Asian ($Z = 2.49, p = 0.006$). Conversely, the magnitude of the relationship between panic symptoms and panic severity was similar across participants identifying themselves as Caucasian, Hispanic, and Asian. These results suggest that among African Americans, increased symptom endorsement may not equate with increased panic severity as strongly as for individuals indentifying as Asian, Caucasian, or Hispanic.

Discussion

This study investigated the experience of panic across four major racial/ethnic groups (Caucasian, African American, Hispanic, and Asian). Overall panic symptom endorsement was similar across these groups; however, differential rates of endorsement were found for specific panic symptoms. Individuals identifying as Asian endorsed dizziness and unsteady feelings more so than did individuals identifying as either African American or Caucasian, and also scored significantly higher than individuals identifying as Caucasian on items assessing symptoms of being terrified and feelings of choking. These findings correspond with previous studies that suggest some Asian individuals tend to endorse more somatic symptoms than do individuals indentifying as Caucasian (Lee, Lei, & Sue, 2001). Furthermore, the increased endorsement of dizziness and unsteady feelings is similar to what might be expected in some indigenous Asian populations such as native Cambodians (Hinton et al., 2008; McNally,

2008). It is possible that individuals identifying as Asian are particularly sensitive to such bodily sensations due to cultural interpretations attached to the meaning of these symptoms.

Conversely, individuals identifying as African American scored significantly lower on the item assessing nervousness than did individuals identifying as Caucasian, and also scored significantly lower on the item assessing flushness of the face in comparison to individuals identifying as either Caucasian or Asian. The finding that the African American group endorsed lower rates of nervousness lends support to the hypothesis that African Americans prefer to maintain control of their emotional state due to fears that losing control may be interpreted as a sign of weakness (Carter et al., 1999). African Americans in this sample did not endorse higher rates of tingling or numbness in the extremities in comparison with Caucasian participants. Previous reports of this potential racial difference are mixed, with some researchers reporting higher rates of numbness in African Americans vs. Caucasians (Horwath, Johnson, & Horing, 1994; Smith, Friedman, & Nevid, 1999), and other studies failing to find a significant difference between the two groups (Asnaani et al., 2009). Interestingly, and also in contrast with previous research (Hollifield, Finley, & Skipper, 2003), Hispanic participants in this study did not endorse specific somatic symptoms more frequently than their Caucasian counterparts.

The results from this study support previously reported racial/ethnic panic symptom profiles for Asian, and to a lesser extent African American groups, but not for individuals identifying as Hispanic. One potential explanation for these mixed findings may be related to acculturation or ethnic identity. Although acculturation was not assessed in this study, demographic information from the University of Houston shows that the majority of international students are from Asian countries (International Student and Scholar Services Office, 2009). These data support the assertion that acculturation may be a factor in panic symptom endorsement, and may explain why expected specific panic symptom endorsement was found for Asian but not Hispanic or African American groups in this study. It is possible that the African American and Hispanic groups in this study are primarily composed of highly acculturated students who do not identify as strongly with some of the traditional expressions of anxiety and panic as would other individuals within the same ethnic/racial group with lower levels of acculturation. Some researchers have suggested that because panic disorder is a well-known phenomenon in Caucasian culture, it may reflect a culturally appropriate idiom of distress (Asnaani et al., 2009). Thus, high levels of acculturation could result in less reliance on more traditional expressions of anxiety and panic. Research on the direct effects of acculturation is rather limited; however, some studies have shown a link between acculturation and mental health status (see Roysircar & Maestas, 2002 for a review). Future research assessing the potential moderating effects of acculturation and ethnic identity could clarify these findings.

This study also examined the relation between common panic symptoms and panic severity across ethnic/racial groups. Although Asian participants generally reported higher levels of symptoms, this did not correspond to increased panic severity in comparison with Caucasian and Hispanic participants. Conversely, correlations between symptomatology and severity were lower for African American participants in comparison with Caucasian and Asian participants, suggesting that endorsement of panic symptoms may be less indicative of pathology in this group, but rather reflective of cultural characteristics or beliefs. Another potential explanation for this finding is that African American individuals may under-report the interference and distress caused by panic symptoms. This theory is supported by Friedman and Paradis' (2002) finding that African Americans tend to be more ashamed of their panic symptoms than Caucasians. It may be that individuals identifying as African American are hesitant to admit to interference and distress related to panic symptoms for fear that they would be labeled "crazy".

There are a number of limitations to the current study. The sample consisted of undergraduate students and therefore may limit the generalizability of these findings among clinical populations. Additionally, this study examined the experience of panic across broad levels of race and ethnicity and did not take into account the various levels of acculturation and ethnic identity that may exist. Future studies should investigate the experience of panic at more specific levels of race/ethnicity (i.e., Southeast Asian vs. South Asian and Eastern Indian) and take into account variables such as generational status, acculturation, and ethnic identity. Finally, it must be acknowledged that the measures used to assess panic symptoms in the current study are based on Eurocentric models of panic attacks, and therefore may not assess symptoms specific to, or more commonly reported by, individuals from different racial or cultural backgrounds. For example, isolated sleep paralysis is frequently reported during nocturnal panic attacks among individuals of African (particularly Nigerian; Onuogu, 1995) descent although this symptom is not typically assessed on general measures of panic symptoms. Therefore, broader racial and ethnic differences in panic symptoms may exist but were not identified in the current study. Despite these limitations, the large sample size used in this study provides results that are generalizable to other non-clinical populations. Furthermore, the examination of the relationship between symptomology and dysfunction provides a significant contribution to the existing literature.

In conclusion, this study suggests that although the overall severity of panic disorder is similar across racial/ethnic groups, symptoms of panic may be experienced differently across cultural groups. Additionally, the association between panic symptoms and panic disorder was found to differ somewhat across groups, indicating that higher levels of symptom endorsement are not always indicative of increased severity or impairment. These findings highlight the need for clinicians and researchers to assess panic symptoms and panic disorder within the context of culture.

References

- Asnaani A, Gutner CA, Hinton DE, Hofmann SG. Panic disorder, panic attacks and panic attack symptoms across race-ethnic groups: Results of the collaborative psychiatric epidemiology studies. *CNS Neuroscience & Therapeutics* 2009;15:249–254. [PubMed: 19691544]
- Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology* 1988;56:893–897. [PubMed: 3204199]
- Bell CC, Shakoor B, Thompson B, Dew D, Hughley E, Mays R, et al. Prevalence of isolated sleep paralysis in Black subjects. *Journal of the National Medical Association* 1984;76:501–508. [PubMed: 6737506]
- Canino G. Are somatic symptoms and related distress more prevalent in Hispanic/Latino youth? Some methodological considerations. *Journal of Clinical Child and Adolescent Psychology* 2004;33:272–275. [PubMed: 15136191]
- Carter MM, Miller OJ, Sbrocco T, Suchday S, Lewis EL. Factor structure of the Anxiety Sensitivity Index among African American college students. *Psychological assessment* 1999;11:525–533.
- Cintrón JA, Carter MM, Sbrocco T. *Ataques de nervios* in relation to anxiety sensitivity among island Puerto Ricans. *Culture, Medicine and Psychiatry* 2005;29:415–431.
- Cox BJ, Cohen E, Dorenfeld DM, Swinson RP. Does the Beck Anxiety Inventory measure anything beyond panic attack symptoms? *Behaviour Research and Therapy* 1996;34:949–954. [PubMed: 8990548]
- Creamer M, Foran J, Bell R. The Beck Anxiety Inventory in a non-clinical sample. *Behaviour Research and Therapy* 1995;33:477–485. [PubMed: 7755538]
- Eaton, WW.; Kessler, LG. Epidemiologic field methods in psychiatry: The NIMH epidemiologic catchment area program. Orlando, FL: Academic Press; 1985.
- Friedman S, Paradis C. African-American patients with panic disorder and agoraphobia. *Journal of Anxiety Disorders* 1991;5:35–41.

- Friedman S, Paradis C. Panic disorder in African-Americans: Symptomology and isolated sleep paralysis. *Culture, Medicine, & Psychiatry* 2002;26:179–198.
- Good, BJ.; Kleinman, AM. Culture and anxiety: Cross-cultural evidence for the patterning of anxiety disorders. In: Tuma, AH.; Maser, JD., editors. *Anxiety and Anxiety Disorders*. Hillsdale, NJ: Erlbaum; 1985. p. 297–323.
- Guarnaccia PJ, Canino G, Rubio-Stipec M, Bravo M. The prevalence of ataques de nervios in the Puerto Rico Disaster Study: The role of culture in Psychiatric Epidemiology. *Journal of Nervous and Mental Disease* 1993;181:165–185.
- Guarnaccia PJ, Rivera M, Franco F, Neighbors C. The experiences of ataques de nervios: Towards an anthropology of emotions in Puerto Rico. *Culture, Medicine and Psychiatry* 1996;20:343–367.
- Goodman WK, Price LH, Rasmussen SA, Mazure C, Fleischmann RL, Hill CL, et al. The Yale-Brown Obsessive Compulsive Scale I: Development, use, and reliability. *Archives of General Psychiatry* 1989a;46:1006–1011. [PubMed: 2684084]
- Goodman WK, Price LH, Rasmussen SA, Mazure C, Delgado P, Heninger GR, Charney DS. The Yale-Brown Obsessive Compulsive Scale II: Validity. *Archives of General Psychiatry* 1989b;46:1012–1016. [PubMed: 2510699]
- Hinton DE, Hofmann SG, Pitman RK, Pollack MH, Barlow DH. The panic attack-posttraumatic stress disorder model: Applicability to orthostatic panic among Cambodian refugees. *Cognitive Behaviour Therapy* 2008;37:101–116. [PubMed: 18470741]
- Hollifield M, Finley MR, Skipper B. Panic disorder phenomenology in urban self-identified Caucasian-Non-Hispanics and Caucasian-Hispanics. *Depression and Anxiety* 2003;18:7–17. [PubMed: 12900948]
- Horwath, E.; Johnson, J.; Horing, CD. Epidemiology of panic disorder. In: Friedman, S., editor. *Anxiety disorders in African Americans*. New York: Springer; 1994. p. 53–64.
- Houck PR, Spiegel DA, Shear MK, Rucci P. Reliability of the self-report version of the panic disorder severity scale. *Depression and Anxiety* 2002;15:183–185. [PubMed: 12112724]
- International Student and Scholar Services Office. Annual enrollment report: International students & Scholars. Division of Student Affairs, University of Houston; 2009.
- Kleinman, A.; Good, B.; Guarnaccia, P. Critical review of selected cross-cultural literature on depression and anxiety disorders: Final report under a contract with NIMH. Government Printing Office; Washington, DC (PLO 85MO29642401D): 1986.
- LaBruzza, AL.; Méndez-Villarrubia, JM. Using DSM-IV: A clinician's guide to psychiatric diagnosis. Lanham, MD: Jason Aronson; 1994.
- Lee, J.; Lei, A.; Sue, S. The current state of mental health research on Asian Americans. In: Choi, NG., editor. *Psychosocial aspects of the Asian American experience: Diversity within diversity*. New York: Haworth Press; 2001.
- Liebowitz MR, Salmán E, Jusino CM, Garfinkel R. Ataque de nervios and panic disorder. *American Journal of Psychiatry* 1994;151:871–875. [PubMed: 8184996]
- Lim YJ, Yu BH, Kim JH. Korean Panic Disorder Severity Scale: construct validity by confirmatory factor analysis. *Depression and Anxiety* 2007;24:95–102. [PubMed: 16845647]
- Makanjuola ROA, Morakinyo VO. "Ode Ori": A culture-bound disorder with prominent somatic features in Yoruba Nigerian patients. *Acta Psychiatrica Scandinavia* 1987;75:231.
- McNally RJ. Panic and posttraumatic stress disorder: Implications for culture, risk, and treatment. *Cognitive Behaviour Therapy* 2008;37:131–134. [PubMed: 18470743]
- Monkul ES, Tural Ü, Onur E, Fidanar H, Alkin T, Shear MK. Panic Disorder Severity Scale: Reliability and validity of the Turkish version. *Depression and Anxiety* 2004;20:8–16. [PubMed: 15368591]
- Norton GR, Dorward J, Cox BJ. Factors associated with panic attacks in non-clinical subjects. *Behavior Therapy* 1986;17:239–252.
- Norton GR, Harrison B, Hauch J, Rhodes L. Characteristics of people with infrequent panic attacks. *Journal of Abnormal Psychology* 1985;94:216–221. [PubMed: 3998290]
- Norton PJ. Diagnostic measures and underlying constructs: an analysis of correspondence in the anxiety disorders. *Anxiety, Stress, & Coping* 2006;19:227–239.

- Onuogu E. Isolated sleep paralysis [Letter to the Editor]. *Psychiatric Services* 1995;46:291. [PubMed: 7796223]
- Roysircar, G.; Maestas, ML. Assessing acculturation and cultural variables. In: Kurasaki, KS.; Okazaki, S.; Sue, S., editors. *Asian American mental health: Assessment theories and methods*. New York: Plenum Publishers; 2002.
- Shear KM, Brown TA, Barlow DH, Money R, Sholomskas DE, Woods SW, et al. Multicenter Collaborative Panic Disorder Severity Scale. *American Journal of Psychiatry* 1997;154:1571–1575. [PubMed: 9356566]
- Shear MK, Rucci P, Williams J, Frank E, Grochocinski V, Vanderbilt J, et al. Reliability and validity of the panic disorder severity scale: Replication and extension. *Journal of Psychiatric Research* 2001;35:293–296. [PubMed: 11591432]
- Smith LC, Friedman S, Nevid J. Clinical and Sociocultural differences in African American and European American patients with panic disorder and agoraphobia. *Journal of Nervous and Mental Disease* 1999;187:549–560. [PubMed: 10496510]
- Varela RE, Vernberg EM, Sanchez-Sosa JJ, Riveros A, Mitchell M, Mashunkashey J. Anxiety reporting and culturally associated interpretation biases and cognitive schemas: A comparison of Mexican, Mexican American, and European American families. *Journal of Clinical Child and Adolescent Psychology* 2004;33:237–247. [PubMed: 15136187]
- Washington CS, Norton PJ, Temple S. Obsessive-compulsive symptoms and obsessive-compulsive disorder. *Journal of Nervous and Mental Disease* 2008;196:456–461. [PubMed: 18552622]
- Yamamoto I, Nakano Y, Watanabe N, Noda Y, Furukawa TA, Kanai T, et al. Cross-cultural evaluation of the Panic Disorder Severity Scale in Japan. *Depression and Anxiety* 2004;20:17–22. [PubMed: 15368592]

Table 1

Mean Scores and Standard Deviations of Measures Across Race

Scale	Race							
	Caucasian		Asian American		Hispanic		African American	
	M	SD	M	SD	M	SD	M	SD
PDSS Total	3.34	(4.50)	3.57	(4.99)	3.11	(4.42)	2.81	(4.54)
BAI Total	10.56	(9.47)	11.79	(10.65)	10.48	(10.52)	9.87	(10.27)
<i>numbness</i>	0.29	(0.60)	0.35	(0.60)	0.31	(0.61)	0.37	(0.65)
<i>feeling hot</i>	0.78	(0.81)	0.75	(0.75)	0.74	(0.79)	0.70	(0.81)
<i>wobbliness</i>	0.31	(0.65)	0.39	(0.67)	0.38	(0.70)	0.30	(0.63)
<i>can't relax</i>	1.04	(0.93)	0.97	(0.90)	0.91	(0.97)	0.89	(0.90)
<i>fear worst</i>	0.80	(0.88)	0.90	(0.69)	0.79	(0.92)	0.77	(0.93)
<i>dizzy</i>	0.45 ^a	(0.71)	0.64 ^b	(0.86)	0.46 ^a	(0.77)	0.43 ^a	(0.70)
<i>racing heart</i>	0.48	(0.73)	0.62	(0.80)	0.54	(0.79)	0.49	(0.77)
<i>unsteady</i>	0.43 ^a	(0.67)	0.62 ^b	(0.81)	0.56 ^{ab}	(0.80)	0.42 ^a	(0.70)
<i>terrified</i>	0.33 ^a	(0.67)	0.54 ^b	(0.81)	0.40 ^a	(0.74)	0.38 ^a	(0.72)
<i>nervous</i>	1.15 ^b	(0.81)	1.06 ^b	(0.90)	1.01 ^{ab}	(0.87)	0.88 ^a	(0.85)
<i>choking</i>	0.10 ^a	(0.36)	0.25 ^b	(0.63)	0.15 ^{ab}	(0.51)	0.16 ^{ab}	(0.54)
<i>trembling</i>	0.28	(0.61)	0.38	(0.73)	0.39	(0.74)	0.41	(0.77)
<i>shaky</i>	0.38	(0.66)	0.42	(0.72)	0.37	(0.67)	0.37	(0.72)
<i>lose control</i>	0.54	(0.80)	0.53	(0.79)	0.48	(0.76)	0.51	(0.82)
<i>breathing</i>	0.29	(0.62)	0.36	(0.73)	0.28	(0.63)	0.29	(0.61)
<i>dying</i>	0.28	(0.66)	0.36	(0.70)	0.30	(0.64)	0.34	(0.69)
<i>scared</i>	0.66	(0.83)	0.74	(0.81)	0.67	(0.81)	0.56	(0.75)
<i>indigestion</i>	0.73	(0.85)	0.65	(0.81)	0.70	(0.97)	0.62	(0.89)
<i>faint</i>	0.25	(0.56)	0.31	(0.61)	0.25	(0.61)	0.29	(0.64)
<i>face flushed</i>	0.55 ^b	(0.72)	0.47 ^b	(0.71)	0.43 ^b	(0.71)	0.29 ^a	(0.69)
<i>sweating</i>	0.46	(0.72)	0.53	(0.78)	0.42	(0.75)	0.48	(0.86)

Note: Differing superscripts refer to significant mean differences.

Table 2

Correlations between BAI and PDSS Scores Across Ethnicities

African American	Caucasian	Hispanic	Asian American
0.647	0.746	0.719	0.767