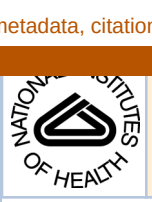

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Beyond Anxious Predisposition: Do *Padecer de Nervios* and *Ataque de Nervios* Add Incremental Validity to Predictions of Current Distress among Mexican Mothers?

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Abstract

Background—*Nervios (PNRV)* and *ataque de nervios* (*ATQ*) are culture-bound syndromes with overlapping symptoms of anxiety, depression, and dissociation, shown to have inconsistent associations to psychiatric disorder. Few studies test the basic assumption that *PNRV* and *ATQ* are uniformly linked to distress outcomes across Latina/o immigrant groups. This study examined: (a) the extent to which acculturative stress, Latino/U.S. American acculturation, and anxious predisposition were associated with lifetime history of *ATQ* and *PNRV*, and (b) the extent to which *ATQ* and *PNRV* add incremental validity in explaining acculturative stress and psychological distress beyond measures of anxious predisposition.

Method—Participants (n = 82) included Mexican mothers who completed surveys on acculturation, trait anxiety, anxiety sensitivity, lifetime *ATQ/PNRV*, psychological distress, and acculturative stress.

Results—Lifetime *PNRV*, but not lifetime *ATQ*, was significantly predictive of psychological distress. *PNRV* was also linked to trait anxiety. Psychometric measures of anxious predisposition (trait anxiety, anxiety sensitivity) were more robust predictors of distress outcomes than lifetime history of *ATQ/PNRV*.

Conclusions—Inquiry into lifetime history of *nervios* may be a useful point of entry in talking to Mexican immigrant mothers about stress and distress. However, standard tools for assessing anxiety sensitivity and trait anxiety appear most useful in identifying and explaining presence of psychological distress. Further research is needed to determine the cross-cultural relevance of trait anxiety and anxiety sensitivity, and its implications for the development of anxiety treatments that are effective across cultures.

Keywords

anxiety sensitivity; culture-bound syndrome; nervios; Latinos; clinical utility

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INTRODUCTION

Three decades of empirical advances in the cross-cultural study of psychopathology catalyzed inclusion of *Appendix I* in DSM-IV.[1, 2] *Appendix I* provides an outline for cultural formulation and a glossary of culture-bound syndromes. Its inclusion in psychiatry's textbook of nosology represented formal recognition of the notion that cultural context could modulate the phenomenology and assessment of psychopathology.[2] Over 40% of the culture-bound syndromes listed in *Appendix I* explicitly refer to an overlap with anxiety pathology, and much research has focused on the links between these syndromes and DSM's anxiety disorders. Proponents of a culturally-informed psychiatric nosology have called for fuller integration of *experience-near* concepts such as culture-bound syndromes within DSM-V and subsequent editions,[3] but an empirical framework to guide integration of these culturally embedded psychological phenomena with information from conventional diagnostic instruments still does not exist. This study is one of the first to examine the clinical validity and utility of assessing lifetime history of *nervios* and *ataque de nervios*, (two culture-bound syndromes prevalent among Latina/os and included in the DSM-IV), among a community sample of Mexicans, relative to assessments utilizing Western measures of anxious predisposition.

The DSM-IV Glossary of Culture-Bound Syndromes defines *nervios* and *ataque de nervios* as idioms of distress with overlapping symptoms of anxiety, depression, and dissociation, used throughout Latin America and the Caribbean. [1, 4] Idioms of distress reflect a broad range of expressions of negative feeling states commonly endorsed among members of a specific community.[5] *Nervios* ["nerves"] refer to a chronic, generalized sense of psychological distress;[6–8] variants of the term are used across cultural groups.[9] *Padecer de nervios* (*PNRV*) is the state of suffering from *nervios*. Between15.5% to 62.5% of Latina/os from Central America, Mexico, the Caribbean, and the U.S. endorse a lifetime history of *nervios* with variations in rates by geographic region. [6, 10–21] Across communities, *nervios* is described as an "emotional problem" [20] occurring in the context of an interpersonal incident or physical condition, often accompanied by distressing negative emotions, associated behavioral changes, and co-occurring depressive symptoms. [6, 22–24] Women report a higher prevalence than men, [10, 13, 25] and a history of *nervios* predicts higher odds for lifetime affective and anxiety disorders. [13]

In contrast, *ataque de nervios* ["attack of nerves"; *ATQ*] involves typical and atypical panic symptoms such as loss of control, crying, rage, aggressiveness, amnesia, and ensuing sense of relief.[26, 27] In the U.S., lifetime history of *ATQ* is endorsed most frequently among Puerto Ricans (15%), followed by Mexicans (9.6%), and Cubans (9%), [28] with comparable rates observed among island Puerto Ricans. [25, 29] Among clinical samples, prevalence rates can be as high as 70%. [30, 31] Endorsement of *ATQ* is higher among women, and those who are highly acculturated to U.S. American life ways, widowed/separated/divorced, [28] of low educational attainment, or over age 45.[25] Despite evidence that degree of acculturation to Latino ways of life may be the most significant indicator of a tendency to present and experience distress in culturally consonant terms, the association between level of acculturation and *ATQ* history has been inconsistent [32, 33].

Similar to *nervios*, reports of *ATQ* are associated with lifetime mood, anxiety, and substance use disorders, clinical severity, psychiatric hospitalizations, use of primary medical and tertiary mental health services, and non-criterion PTSD symptoms.[25, 28, 34] Unlike *nervios*, frequent *ATQs* are also linked to dissociative symptoms, [35] childhood trauma, [36] dissociative predisposition, [37] unexplained neurological symptoms and panic disorder. [38]

Most of the literature on *ATQ* has focused on understanding its relationship to panic attacks and anxiety sensitivity. Findings indicate that *ATQs* are not culturally sanctioned panic attacks as originally postulated.[30] Key defining features of *ATQs* include presence of an identifiable trigger, aggression, dissociative symptoms, suicidality, absence of avoidant behavior, and prolonged symptom development, which contrasts with the acute progression of symptoms present in DSM-defined panic attacks. [27, 31, 32, 39, 40] However, there is evidence of an association between *ATQ* and anxiety sensitivity. Latina/o community participants with history of *ATQ* are similar to those with elevated anxiety sensitivity and no history of *ATQ* in measures of anxiety and psychopathology. [32] Among clinical samples, anxiety sensitivity and dissociative predisposition are significant predictors of *ATQ* severity; but only anxiety sensitivity predicts past-month *ATQ*. [41, 42] Fear of negative emotions (e.g., anger and anxiety) and fear of physiological symptoms, as captured by a measure of anxiety sensitivity, are strong predictors of *ATQ* severity. Though there are contradictory data, [33] the emerging evidence supports the proposal that the fear of arousal symptoms associated with high anxiety sensitivity generates a heightened secondary fear response when an *ataque* occurs, escalating fear in a positive feedback loop, and creating a self-perpetuating fear cycle.[42]

In sum, the relationship between lifetime or current *ATQ*/*PNRV* and psychiatric disorder and/or distress is not one-to-one.[13, 28] *ATQ* is not isomorphic to panic attacks or anxiety sensitivity, and level of acculturation is not a consistent predictor of *ATQ*. However, most of the extant literature has focused on *ATQ* among Puerto Ricans. There is evidence that cultural "idioms of distress" may be used differently across cultures.[5, 9] Mexicans compose the largest ethnic group within the Latina/o population in the U.S.[43], but it is not yet known whether *ATQ/PNRV* carry similar clinical value in Mexican compared to Puerto Rican populations, and whether the association between acculturation, anxious predisposition, distress, *ATQ* and *PNRV* are similarly patterned in these communities. Answering calls to investigate culture-bound syndromes on their own terms, [44] this study examined: (a) the extent to which acculturative stress, Mexican/U.S. American acculturation, and anxious predisposition were associated with lifetime history of *ATQ* and *PNRV*, and (b) the extent to which *ATQ* and *PNRV* add incremental validity in explaining acculturative stress and psychological distress beyond anxious predisposition. These data are among the first to examine *ATQ* and *PNRV* in a Mexican sample, examining links to acculturation, acculturative stress, and anxious predisposition as measured with Western instruments. Herein, *psychological* acculturation refers to the behavioral, attitudinal, identity, linguistic, and value changes that occur in an individual as the result of long-term contact with people sharing initially unfamiliar cultural practices.[45–50] The related term "acculturative stress" refers to the broad negative cognitive, behavioral, and emotional changes that are due to and sustained by immigration related stressors. [51, 52] We tested three hypotheses:

1. Mexican acculturation, acculturative stress, anxiety sensitivity, and trait anxiety would be associated with increased odds for lifetime *ATQ*/*PNRV* after adjusting for age and English proficiency.
2. Lifetime *ATQ* would add incremental validity in predicting past-week psychological distress beyond trait anxiety and anxiety sensitivity.
3. Lifetime *ATQ*/*PNRV* would be more robust predictors than anxiety sensitivity and trait anxiety of past three-month acculturative stress.

The theoretical foundation for these hypotheses posits that attention to cultural "idioms of distress" may be critical to a proper understanding of the clinical complaints and types of distress that Latina/os report in U.S. American mental health clinics. For example, cultural idioms may be used systematically to signal individual level psychiatric vulnerabilities (e.g., anxious predisposition) that generate distress (e.g., acculturative stress) and motivate help-

seeking. Perceived stress may also increase the frequency and severity of these idiomatic experiences. Thus, a deeper understanding of these interactions may be essential to shaping more effective treatments for this large and growing segment of the U.S. population.

MATERIALS & METHODS

Participants

Ninety-nine Mexican adult mothers of infant, preschool, or elementary school age children were recruited. Eighty-two provided complete data and were included in final analyses. The mean age was approximately 30 years (Table 1). Approximately 88% had an 8th grade educational level, and over 90% were married. The majority (98.7%)self-identified as first-generation or foreign-born immigrants. All were enrolled in a family English literacy program in a Midwestern city, and were recruited from five sites serving predominantly Mexican (migrant or immigrant) families. All signed informed consent (approved by university and literacy program IRBs).

Measures

A dichotomous survey assessed whether participants endorsed lifetime history of *ATQ* or *PNRV*. Respondents were asked: 1) have you ever had an *ataque de nervios*? and 2) have you ever suffered from *nervios*? There are no official diagnostic criteria for these constructs, and our goal was to capture self-identified use of the cultural idioms, as a potential expression of mental distress or disorder. Data from a small subset of participants (n = 22) endorsing lifetime history of *ATQ* or *PNRV* verified that these survey items captured participants with significant typical and atypical panic symptom burdens (M = 8.46; SD = 3.58) and significant rates of lifetime (54.54%) and past-month (31.82%) mood or anxiety disorders as diagnosed by the SCID.[53]

The Acculturation Rating Scale for Mexican Americans-Revised (ARSMA-II) was used to assess acculturation status.[45] This multidimensional scale assesses extent of involvement in Mexican and “Anglo” culture, providing independent subscales for Mexican Orientation (MOS), and Anglo Orientation (AOS). In this sample, Cronbach’s alpha coefficients indicated good internal consistency for the AOS subscale (α = .81) and adequate consistency for MOS subscale (α = .67). The Basic English Skills Test (BEST) was used to measure English proficiency.[54] Scaled scores yield English as a Second Language (ESL) education and functioning levels. Testing occurred within two months of study participation. The Spanish Version of the Brief Symptom Inventory (BSI)[55, 56] was administered to assess psychological distress. The BSI includes 53 items about past week distress.[57, 58] Its Global Severity Index provides a composite measure of psychological distress. The BSI displayed good internal consistency in this sample (α = .97). The Immigrant Version of the Hispanic Stress Inventory (HSI)[59] was used to measure acculturative stress. This instrument measures distress/worry associated with interpersonal, economic and immigration conflict in the past three-months. Our Cronbach’s alpha coefficient (α = .92) indicated good internal consistency. The acculturative stress composite variable was divided by ten so as to facilitate meaningful interpretation of unit increment changes in the outcome variable. Anxiety sensitivity was measured with the Anxiety Sensitivity Index (ASI),[60, 61] which taps the extent to which a person finds anxiety-related sensations to be frightening or catastrophic.[60–62] Good internal consistency was observed (α =.82). Trait anxiety was measured with the trait scale of the State/Trait Anxiety Inventory (STAI T-Anxiety),[63, 64] which assessed proneness to anxiety and tendency to appraise stressful situations as threatening. The STAI-T exhibited good internal consistency (α = .79).

Procedure

Participants were recruited through flyers and in-person efforts. Participation was voluntary and confidential. After consenting, interested mothers completed the survey battery in Spanish. All instruments were previously translated and validated in Spanish-speaking Latina/o communities.[65–68] Participants received $10 for their time and were given a list of local mental health resources. Data for 53 participants were collected between November 2007 and May 2008 from two sites serving immigrant and migrant mothers of preschool children (Cohort 1). An additional 46 participants were recruited in May and June 2009 from three additional sites serving immigrant mothers with elementary school-age children (Cohort 2).

RESULTS

Descriptive Statistics

Thirty four participants endorsed lifetime *ATQ*, whereas 48 endorsed lifetime *PNRV* (Table 1). Participants in Cohort 1 were younger, with lower English proficiency scores and higher Mexican acculturation relative to participants in Cohort 2. These differences were expected because we recruited mothers of preschool children for Cohort 1, who were likely to be younger and more recent immigrants than those recruited for Cohort 2 who were mothers of elementary school age children. Participants had High Beginning English proficiency, which indicates they could understand, speak, read, and write common words, phrases, and sentences. Participants were high in psychological distress, scoring in the 90th percentile of the normative adult female population on the BSI distress scale. They scored in the nonclinical range for trait anxiety and anxiety sensitivity. Mean ASI scores were similar to those reported in normative populations in Spain and Puerto Rico, [32, 69] as well as those observed among English speaking normal controls.[62]

Missing Data

Data were incomplete for 24% of initially enrolled participants, equally distributed across study variables with the exception of English proficiency. We used regression estimates to impute missing English Proficiency scores (n =10). Sensitivity analyses were conducted to determine whether deletion of this variable would yield significant changes in regression estimates compared to inclusion as an imputed variable. The regression estimates did not change, so the imputed variable was used. There were no significant differences found between included (n = 82) and excluded participants (n = 17).

Bivariate Analyses

Pearson product-correlation analyses (Table 2) and bivariate logistic/linear regression analyses were conducted as an initial step. Odds for self-reported lifetime *ATQ* were higher among those with positive histories of *PNRV* (Odds Ratio [OR]=4.96; 95% Confidence Interval [CI]=(1.81, 13.59); p<.01). Odds for lifetime *PNRV* were higher among those with psychological distress (OR=6.14; 95% CI=2.07, 18.16; p<.001), acculturative stress (OR=1.23; 95% CI=1.00, 1.50; p<.05), and trait anxiety (OR=1.07; 95% CI=1.02, 1.12; p<.01). Current acculturative stress was related to lifetime *ATQ* (β=.21, p<.05), anxiety sensitivity (β=.45, p<.001), and trait anxiety (β=.48, p<.001). Current psychological distress was related to lifetime *PNRV* (β=.36, p<.001), current acculturative stress (β=.49, p<.001), anxiety sensitivity (β=.51, p<.001), and trait anxiety (β=.68, p<.001).

Are ATQ/PNRV Associated with Acculturative Stress, Acculturation, and Anxiety?

To examine if acculturative stress, acculturation, and anxiety resulted in increased odds of lifetime *ATQ/PNRV* after controlling for age and English Proficiency, two sets of

hierarchical logistic regressions were conducted with lifetime *ATQ* or *PNRV* as the outcomes. Predictors were entered in five blocks (Table 3). Based on "initial step" analyses, psychological distress was excluded due to high correlation with trait anxiety and evidence of multicollinearity.[70]

The variables in Model 5a (Table 3)[1] explained 23% of the variance in lifetime *ATQ*. As in the unadjusted model, positive history of *PNRV* resulted in three-fold increase of lifetime *ATQ* relative to those with negative history of *PNRV*. Lifetime *PNRV* uniquely accounted for 9% of the variance. Similarly, the variables in Model 5b explained 28% of the variance in lifetime *PNRV*. As in the first set of analyses, lifetime *ATQ* was related to higher odds for lifetime *PNRV* relative to those with unremarkable lifetime *ATQ*; lifetime *ATQ* was responsible for the majority of the variance that explained lifetime *PNRV* (R^2 = 10%). Trait anxiety was significant in predicting lifetime *PNRV* in Model 4b and marginally significant in Model 5b when lifetime *ATQ* was included. Mexican acculturation and acculturative stress were not related to lifetime *ATQ* or *PNRV*.

Is Current Psychological Distress Predicted by ATQ/PNRV?

Hierarchical linear regression was used to examine the extent to which lifetime *ATQ/PNRV* were unique predictors of past-week psychological distress adjusting for age, English proficiency, and anxiety. Mexican and U.S. American acculturation subscales were excluded because they were not statistically related to psychological distress at the bivariate level. The predictors were entered in five blocks (Table 4). The variables in the fifth model explained 62% of the variance in psychological distress. Acculturative stress (β=.19, p<.05), anxiety sensitivity (β=.28, p<.01) and trait anxiety (β=.43, p<.001) all significantly predicted psychological distress when age and English proficiency were held constant. Positive history of *PNRV* (β=.20, p<.05) added a small but significant amount of additional predictive power, accounting for an additional 3% of the variance in psychological distress, beyond that explained by the other variables.

Is Current Acculturative Stress Predicted by ATQ/PNRV?

Hierarchical linear regression was used to examine if lifetime *ATQ*/*PNRV* was predictive of three-month acculturative stress after controlling for age, English proficiency, and anxiety. The predictors were entered in four blocks (Table 5). Acculturation subscales were excluded because they were not statistically associated with acculturative stress at the bivariate level. Variables in the third model accounted for 34% of the variance. Anxiety sensitivity (β=.36, p<.001) and trait anxiety (β=.32, p<.01) were predictive of acculturative stress. Anxiety sensitivity *(*R^2=24%) followed by trait anxiety (R^2=9%) accounted for the majority of the variance in acculturative stress. Any effect of lifetime *ATQ* on acculturative stress disappeared when anxious predisposition was considered in the full model.

DISCUSSION

Herein we examined whether lifetime history of culturally sanctioned idioms of distress, *ATQ* and *PNRV*, provided more robust predictors of distress outcomes in a Mexican immigrant population than psychometrically-derived Western measures of anxious predisposition. Surprisingly, they did not – Western instruments measuring anxiety sensitivity (ASI) and trait anxiety (STAI-T) provided stronger predictors of psychological distress and acculturative stress than endorsed history of the culturally-bound "anxiety" syndromes. However, *ATQ/PNRV* did have differential associations to distress in this community, with *PNRV* providing some predictive power.

[1]Only the significant hierarchical regression models will be included in Tables 3–5.

Across unadjusted and adjusted models, lifetime *ATQ* was largely associated with lifetime *PNRV*. Despite the interrelatedness, there were points of distinction. For example, lifetime *PNRV* emerged as a significant and consistent predictor of psychological distress, but lifetime *ATQ* did not. Lifetime *PNRV* was also associated with trait anxiety in unadjusted models and marginally so in adjusted models. Thus, it is possible that the relationship between *ATQ* and *PNRV* may be similar to the relationship between *state* level anxiety/negative affect and *trait* level neuroticism/negative emotionality. Neuroticism is a trait that is associated with general distress vulnerability and a tendency to experience negative affect.[71] Endorsement of *nervios* in a Mexican immigrant population may reflect a related type of general distress vulnerability. Endorsing a history of *ataques* may reflect vulnerability to a more specific and temporary state of behavioral disruption that is less associated with general stress and distress. However, the data tentatively suggest that if seeking to detect a general predisposition to distress among Mexican mothers, whether acute or chronic, a measure of lifetime *PNRV* would be more useful than a measure of lifetime *ATQ*.

Disconfirming our hypotheses, measures of anxious predisposition were more consistent and robust predictors of distress outcomes in comparison to history of *ATQ/PNRV*. This result converges with previous research noting an association between anxious predisposition, psychopathology, and stress among Latina/os.[32, 65] Anxiety sensitivity was a more robust predictor of acculturative stress than trait anxiety. Perhaps anxiety sensitivity and acculturative stress both tap the latent constructs of fear of uncertainty and lack of control typically discussed in models of normative and pathological worry, and intolerance of negative affect/emotion described in distress models. [71, 72] It is also possible that stressful contexts associated with the acculturation process may engender distress, which is then amplified by anxiety sensitivity, creating a positive feedback loop and escalating cycle. Anxiety sensitivity may be an important risk factor in the mental health of immigrants that warrants greater attention.

Our hypothesis that acculturation and English proficiency would be significant predictors of distress and lifetime *ATQ/PNRV* was also not supported. Our ability to detect statistically meaningful associations may have been undermined by low variability in acculturation status, use of a community rather than clinical sample,[33] measurement concerns[73], and emphasis on actual rather than *perceived* English proficiency.[74]

This study had several limitations. Participants came from a small convenience sample of community respondents with restricted ranges in acculturation levels. Findings may have differed with a randomly selected sample. Results may also differ in a clinical sample, where rates of psychiatric disorders and distress are likely to be higher. Results have limited generalizability to other Latina/o ethnic groups with a wider range in acculturation status. The measure of *ATQ* and *PNRV* probed lifetime experience, not current or past-month; while other study variables involved current status. Results may have differed if recent experience of *ATQ/PNRV* (e.g., past-month, past six-months) was examined due to temporal ordering effects. Lifetime *ATQ/PNRV* was assessed with a dichotomous survey, which could be vulnerable to reporting biases or unreliability. Furthermore, our measure of *ATQ/PNRV* did not assess for lifetime or current severity, despite research evidence to support a relationship between *ATQ* severity and anxiety sensitivity.[41] More extensive quantitative and qualitative data on the meaning and function of *ATQ/PNRV* in Mexican communities is needed to create greater confidence in the inferences made about the relationships between the culture-bound syndromes, acculturation, anxious predisposition, and psychopathology. Finally, we did not explore contextual factors that might influence mental health status, such as socioeconomic position, available social supports, perceived discrimination, and physical health.[75, 76] Despite these limitations, this study tentatively suggests that the relative

clinical utility and validity of assessing lifetime history of *ATQ* and *PNRV* may vary across diverse Latina/o ethnic groups.

CONCLUSION

Our results suggest that asking about lifetime history of *nervios* (not lifetime *ATQ*) might be a useful point of entry in talking to Mexican immigrant mothers about stress and distress, because it seems to be a meaningful "idiom of distress" – a culturally sanctioned way to discuss affliction that might reflect vulnerability to distress and emotional or behavioral dysfunction. However, anxious predisposition, as measured by standard and widely used psychometric instruments of anxiety sensitivity and trait anxiety, was the most consistent predictor of acculturative stress and psychological distress in this exploratory study. Thus, the constructs of anxiety sensitivity and trait anxiety may capture an important component of distress vulnerability that is applicable across cultures. Contrary to our expectations, these results suggest that Western approaches to treatment for anxiety sensitivity and high trait anxiety may be relevant to reducing distress vulnerability in this population. Further research is needed to determine the cross-cultural relevance of Western clinical approaches to anxious predisposition among Mexican immigrant *clinical* samples, and to develop empirically-informed diagnostic assessments that integrate culture-bound syndromes and Western measures of psychopathology.

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References

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4. Arlington, VA US: American Psychiatric Publishing, Inc; 1994.
2. López SR, Guarnaccia PJJ. Cultural psychopathology: Uncovering the social world of mental illness. Annual Review of Psychology. 2000; 51:571–598.
3. Lewis-Fernández R, et al. Culture and the anxiety disorders: Recommendations for DSM-V. Depression and Anxiety. 2010; 27(2):212–229. [PubMed: 20037918]
4. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (4th edition- text revision). 4. Arlington, VA US: American Psychiatric Publishing; 2000. Text Revision ed
5. Nichter M. Idioms of distress revisited. Culture, Medicine and Psychiatry. 2010; 34(2):401–416.
6. Baer RD, et al. A cross-cultural approach to the study of the folk illness nervios. Culture, Medicine and Psychiatry. 2003; 27(3):315–337.
7. Guarnaccia PJ, Good BJ, Kleinman A. A critical review of epidemiological studies of Puerto Rican mental health. The American Journal of Psychiatry. 1990; 147(11):1449–1456. [PubMed: 2221155]
8. Low, SM. Embodied metaphors: nerves as lived experience. In: Csordas, TJ., editor. Embodiment and experience. The existential ground of culture and self. Cambridge University Press; Great Britain: 1994. p. 139-162.
9. Davis, DL.; Low, SM., editors. Gender, health, and illness: The case of nerves. Hemisphere; New York: 1989.

10. Low, SM. Gender, emotion, and nervios in urban Guatemala. In: Davis, DL.; Low, SM., editors. Gender, health, and illness: The case of nerves. New York: Hemisphere: New York; 1989.
11. Bayles BP, Katerndahl DA. Culture-bound syndromes in Hispanic primary care patients. International Journal of Psychiatry in Medicine. 2009; 39(1):15–31. [PubMed: 19650527]
12. Hill CE, Cottrell L. Traditional mental disorders in a developing West Indian community in Costa Rica. Anthropological Quarterly. 1986; 59(1):1–14.
13. de Snyder VNS, Diaz-Perez MDJ, Ojeda VD. The prevalence of nervios and associated symptomatology among inhabitants of Mexican rural communities. Culture, Medicine and Psychiatry. 2000; 24(4):453–470.
14. Barnett, EA. Notes on nervios: A disorder of menopause. In: DLD; Low, SM., editors. Gender, health, and illness: The case of nerves. Hemisphere; New York: 1989. p. 67-77.
15. Barlett PF, Low SM. Nervios in rural Costa Rica. Medical Anthropology. 1980; 4:523–564.
16. Finerman, R. The burden of responsibility: Duty, depression, and nervios in Andean Ecuador. In: Davis, DL.; Low, SM., editors. Gender, health, and illness: The case of nerves. Hemisphere; New York: 1989. p. 49-65.
17. Guarnaccia PJ, Farias P. The social meanings of nervios: A case study of a Central American woman. Social Science & Medicine. 1988; 26(12):1223–1231. [PubMed: 3206244]
18. Guarnaccia PJ, Lewis-Fernández R, Marano MR. Toward a puerto rican popular nosology: nervios and ataque de nervios. Culture, Medicine and Psychiatry. 2003; 27(3):339–366.
19. Kay, M.; Portillo, C. Nervios and dysphoria in Mexican American widows. In: Davis, DL.; Low, SM., editors. Gender, health, and illness: The case of nerves. Hemisphere; New York: 1989. p. 181-201.
20. Newton, F. The Mexican American emic system of mental illness: An exploratory study. In: Casa, JM.; Keefe, SE., editors. Family and mental health in the Mexican American community. Spanish Speaking Mental Health Center; Los Angeles: 1978. p. 69-90.
21. Low SM. The meaning of nervios: A sociocultural analysis of symptom presentation in San Jose, Costa Rica. Medicine and Psychiatry. 1981; 5:25–47.
22. Cabassa LJ, et al. Azúcar y nervios: Explanatory models and treatment experiences of Hispanics with diabetes and depression. Social Science & Medicine. 2008; 66(12):2413–2424. [PubMed: 18339466]
23. Weller SC, et al. Susto and nervios: Expressions for stress and depression. Culture, Medicine and Psychiatry. 2008; 32(3):406–420.
24. England M, Mysyk A, Gallegos JAA. An examination of nervios among Mexican seasonal farm workers. Nursing Inquiry. 2007; 14(3):189–201. [PubMed: 17718745]
25. Guarnaccia PJ, et al. 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(3): 157–165. [PubMed: 8445374]
26. Guarnaccia PJ, DeLaCancela V, Carrillo E. The multiple meanings of ataques de nervios in the Latino community. Medical Anthropology. 1989; 11(1):47–62. [PubMed: 2725213]
27. Lewis-Fernández R, et al. Comparative phenomenology of ataques de nervios, panic attacks, and panic disorder. Culture, Medicine and Psychiatry. 2002; 26(2):199–223.
28. Guarnaccia PJ, et al. Ataque de nervios as a marker of social and psychiatric vulnerability: Results from the NLAAS. International Journal of Social Psychiatry. 2010; 56(3):298–309. [PubMed: 19592438]
29. Guarnaccia PJ, Rubio-Stipec M, Canino G. Ataques de nervios in the Puerto Rican Diagnostic Interview Schedule: The impact of cultural categories on psychiatric epidemiology. Culture, Medicine and Psychiatry. 1989; 13(3):275–295.
30. Liebowitz MR, et al. Ataque de nervios and panic disorder. The American Journal of Psychiatry. 1994; 151(6):871–875. [PubMed: 8184996]
31. Salmán E, et al. Subtypes of ataques de nervios: The influence of coexisting psychiatric diagnosis. Culture, Medicine and Psychiatry. 1998; 22(2):231–244.
32. Cintrón JA, Carter MM, Sbrocco T. Ataques de nervios in relation to anxiety sensitivity among island Puerto Ricans. Culture, Medicine and Psychiatry. 2005; 29(4):415–431.

33. Keough ME, Timpano KR, Schmidt NB. Ataques de nervios: Culturally bound and distinct from panic attacks? Depression and Anxiety. 2009; 26(1):16–21. [PubMed: 18781666]
34. Norris FH, et al. A qualitative analysis of posttraumatic stress among Mexican victims of disaster. Journal of Traumatic Stress. 2001; 14(4):741–756. [PubMed: 11776421]
35. Lewis-Fernández R, et al. Dissociation, childhood trauma, and ataque de nervios among Puerto Rican psychiatric outpatients. The American Journal of Psychiatry. 2002; 159(9):1603–1605. [PubMed: 12202287]
36. Schechter DS, et al. Ataque de nervios and history of childhood trauma. Journal of Traumatic Stress. 2000; 13(3):529–534. [PubMed: 10948492]
37. Lewis-Fernández R, et al. Association of trauma-related disorders and dissociation with four idioms of distress among Latino psychiatric outpatients. Culture, Medicine, and Psychiatry. in press.
38. Interian A, et al. The Relationship Between Ataque de Nervios and Unexplained Neurological Symptoms: A Preliminary Analysis. Journal of Nervous and Mental Disease. 2005; 193(1):32–39. [PubMed: 15674132]
39. Lewis-Fernández, R., et al. Comparative phenomenology of ataque de nervios, panic attacks, and panic disorder. In: HDE; Good, BJ., editors. Culture and panic disorder. Stanford: Stanford, California; 2009. p. 135-156.
40. San Miguel VEF, et al. A Quantitative Analysis of Ataque de Nervios in Puerto Rico: Further Examination of a Cultural Syndrome. Hispanic Journal of Behavioral Sciences. 2006; 28(3):313–330.
41. Hinton DE, et al. Ataque de nervios: Relationship to anxiety sensitivity and dissociation predisposition. Depression and Anxiety. 2008; 25(6):489–495. [PubMed: 17570492]
42. Hinton DE, Lewis-Fernández R, Pollack MH. A model of the generation of ataque de nervios: The role of fear of negative affect and fear of arousal symptoms. CNS Neuroscience & Therapeutics. 2009; 15(3):264–275. [PubMed: 19691546]
43. U.S. Census Bureau. The Hispanic population in the United States: March 2002. U.S. Census Bureau; Washington DC: 2002.
44. Guarnaccia PJ, Rogler LH. Research on culture-bound syndromes: New directions. The American Journal of Psychiatry. 1999; 156(9):1322–1327. [PubMed: 10484940]
45. Cuéllar I, Arnold B, Maldonado R. Acculturation rating scale for Mexican Americans-II: A revision of the original ARSMA scale. Hispanic Journal of Behavioral Sciences. 1995; 17:275–304.
46. Berry, JW. Acculturation as varieties of adaptation. In: Padilla, A., editor. Acculturation: Theory, models and some new findings. Westview Press; Boulder, CO: 1980. p. 9-26.
47. Berry, JW.; Sam, D. Acculturation and adaptation. In: Berry, JW.; Segall, MH.; Kagitcibasi, C., editors. Handbook of cross-cultural psychology: Social behavior and applications. Ally & Bacon; Boston: 1997. p. 291-326.
48. Graves TD. Acculturation, access, and alcohol in a tri-ethnic community. American Anthropologist. 1967; 69:306–321.
49. Rogler LH, Cortes DE, Malgady RG. Acculturation and mental health status among Hispanics: Convergence and new directions for research. American Psychologist. 1991; 46(6):585–597. [PubMed: 1952420]
50. Santiago-Rivera, AL.; Arredondo, P.; Gallardo-Cooper, M. Counseling Latinos and la familia: A practical guide. Thousand Oaks, CA: Sage; 2002.
51. Berry JW, Annis RC. Acculturative stress: The role of ecology, culture and differentiation. Journal of Cross-Cultural Psychology. 1974; 5(4):382–406.
52. Berry JW. Immigration, acculturation, and adaptation. Applied Psychology: An International Review. 1997; 46(1):5–34.
53. Spitzer RL, et al. The Structured Clinical Interview for DSM-III—R (SCID): I. History, rationale, and description. Archives of General Psychiatry. 1992; 49(8):624–629. [PubMed: 1637252]
54. Agency, TAE. State assessment and goal setting/attainment policy for adult education. 2009.

55. Acosta FX, Nguyen LH, Yamamoto J. Using the Brief Symptom Inventory to profile monolingual Spanish-speaking psychiatric outpatients. Journal of Clinical Psychology. 1994; 50:723–726. [PubMed: 7806649]
56. Ruipérez MA, et al. Psychometric properties of the Spanish version of the BSI: Contributions to the relationship between personality and psychopathology. European Journal of Psychological Assessment. 2001; 17:241–250.
57. Derogatis, LR. Brief symptom inventory: Administration, scoring, and procedures manual. Minneapolis, MN: NCS Pearson; 1993.
58. Derogatis LR, Melisarantos N. The Brief Symptom Inventory: An introductory report. Psychological Medicine. 1983; 13:596–605.
59. Cervantes RC, Padilla A, Salgado de Snyder N. The Hispanic Stress Inventory: A culturally relevant approach to psychosocial assessment. Psychological Assessment. 1991; 3:438–447.
60. Peterson, RA.; Reiss, S. Anxiety Sensitivity Index. 2. Worthington, OH: International Diagnostic Systems; 1992.
61. Reiss S, et al. Anxiety sensitivity, anxiety frequency and the prediction of fearfulness. Behavior Research and Therapy. 1986; 24:1–8.
62. Reiss, S., et al. Anxiety Sensitivity Index consolidated user manual: ASI, ASI-3, and CASI. Worthington, OH: IDS Publishing; 2008.
63. Spielberger, CD.; Gorsuch, RL.; Lushene, RE. Manual for the State-Trait Anxiety Inventory. Palo Alto, CA: Consulting Publishing; 1970.
64. Spielberger, CD., et al. State Trait Inventory for adults: Sampler set, manual, test, scoring key. Redwood City, CA: Mind Garden; 1983.
65. Sandin B, Chorot P, McNally R. Validation of the Spanish version of the Anxiety Sensitivity Index in a clinical sample. Behavior Research and Therapy. 1996; 34:283–290.
66. Cintrón JA, et al. Factor structure and construct validity of the Anxiety Sensitivity Index among island Puerto Ricans. Journal of Anxiety Disorders. 2005; 19:51–68. [PubMed: 15488367]
67. Spielberger CD, et al. Development of the Spanish edition of the State-Trait Anxiety Inventory. Interamerican Journal of Psychology. 1971; 5:145–158.
68. Virella B, Arbona C, Novy DM. Psychometric properties and factor structure of the Spanish version of the State-Trait Anxiety Inventory. Journal of Personality Assessment. 1994; 63:401–412.
69. Sandin B, Chorot P, McNally RJ. Anxiety Sensitivity Index: Normative data and its differentiation from trait anxiety. Behaviour Research and Therapy. 2001; 39(2):213–219. [PubMed: 11153974]
70. Leech, NL.; Barrett, K.; Morgan, G. SPSS for intermediate statistics: Use and Interpretation. Mahwah, NJ: Lawrence Erlbaum; 2005.
71. Naragon-Gainey K. Meta-analysis of the relations of anxiety sensitivity to the depressive and anxiety disorders. Psychological Bulletin. 136(1):128–150. [PubMed: 20063929]
72. McLean, PD.; Woody, SR. Anxiety disorders in adults: An evidence-based approach to psychological treatment. New York, NY US: Oxford University Press; 2001.
73. Zane, N., et al. Major approaches to the measurement of acculturation among ethnic minority populations: A content analysis and an alternative empirical strategy. In: Chun, KM.; Balls Organista, P.; Marin, G., editors. Acculturation: Advances in theory, measurement, and applied research. American Psychological Association; Washington, DC US: 2003. p. 39-60.
74. Gee GC, et al. Self-Reported Discrimination and Mental Health Status Among African Descendants, Mexican Americans, and Other Latinos in the New Hampshire REACH 2010 Initiative: The Added Dimension of Immigration. American Journal of Public Health. 2006; 96(10):1821–1828. [PubMed: 17008579]
75. Dawson, BAj; Panchanadeswaran, S. Discrimination and acculturative stress among first-generation Dominicans. Hispanic Journal of Behavioral Sciences. 2010; 32(2):216.
76. Williams, DR.; Mohammed, S. Poverty, migration, and health. In: Chih Lin, A.; Harris, DR., editors. The colors of poverty. Russell Sage Foundation; New York, NY: 2008. p. 135-169.

Table 1

Background Variables for Entire Sample and Data Cohorts

Variable	Overall Sample *N* =82 M (SD) or N (%)	Cohort 1 *n* =48 M (SD) or N (%)	Cohort 2 *n* = 34 M (SD) or N (%)	t(df) or $\chi 2$(df)
Demographics				
Age	29.88 (5.59)	28.50 (5.21)	31.82 (5.60)	−2.76 (80)**
English Proficiency (BEST Score)	59.08 (12.65)	56.44 (11.94)	62.81(12.85)	−2.30 (80)*
History of Ataques				
No	48 (58.5)	28 (58.3)	20 (58.8)	.002 (1)
Yes	34 (41.5)	20 (41.7)	14 (41.2)	
History of Padecer de Nervios				
No	34 (41.5)	17 (35.4)	17 (50.0)	1.74 (1)
Yes	48 (58.5)	31 (64.6)	17 (50.0)	
Distress/Stress				
Psychological Distress (BSI)	.80 (.57)	.82 (.58)	.79 (.55)	.29 (80)
Acculturative Stress (HSI)	11.56 (2.57)	11.33 (2.48)	11.89 (2.70)	−.96 (80)
Anxiety				
Anxiety Sensitivity (ASI)	17.20 (11.07)	15.77 (10.93)	19.21 (11.12)	−1.39 (80)
Trait Anxiety (STAIY-2)	41.44 (10.07)	41 (9.46)	42.06 (11.00)	−.47 (80)
Acculturation				
US American Acc. (ARSMA AOS)	2.08 (.48)	2.13(.52)	2.01 (.41)	1.13 (80)
Mexican Acc. (ARSMA MOS)	4.26 (.41)	4.34 (.32)	4.15(.49)	2.16 (80)*

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

Table 2

Intercorrelations between primary predictor, demographic, and dependent variables (N = 82)

	1	2	3	4	5	6	7	8	9	10
1. Age	1.00									
2. History of ATQ	−0.14	1.00								
3. History of PNVR	−0.13	.36**	1.00							
4. Psychological Distress	−0.05	0.16	.39**	1.00						
5. Acculturative Stress	0.13	0.14	.23*	.55**	1.00					
6. US American Acculturation	0.12	0.04	0.05	−0.06	0.18	1.00				
7. Mexican Acculturation	−0.06	0.16	0.05	−0.05	0.07	0.15	1.00			
8. Anxiety Sensitivity	0.11	0.07	0.09	.54**	.50**	0.14	−0.08	1.00		
9. Trait Anxiety	0.00	0.19	.30**	.67**	.45**	0.00	−0.16	.40**	1.00	
10. English Proficiency	.23*	0.04	−0.03	−0.05	−0.03	0.09	−0.11	0.04	0.12	1.00

Note.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

Table 3

Summary of Logistic Regression Analyses for Variables Predicting Cultural Syndromes

	Ataque de Nervios				Padecer de Nervios			
	Model 4a		Model 5a		Model 4b		Model 5b	
Step/Variable	**Odds Ratio**	**95% CI**	**Odds Ratio**	**95% CI**	**Odds Ratio**	**95% CI**	**Odds Ratio**	**95% CI**
Constant	0.00†		0.00†		0.03		0.07	
1. Age	0.94	(.86, 1.03)	0.95	(.86, 1.04)	0.95	(.87, 1.04)	0.96	(.88, 1.06)
1. English Proficiency	1.02	(.98, 1.06)	1.02	(.98, 1.06)	1.00	(.96, 1.04)	0.99	(.95, 1.03)
2. Acculturative Stress	1.06	(.85, 1.33)	1.02	(.81, 1.29)	1.16	(.90, 1.50)	1.14	(.88, 1.47)
3. U.S. American Acculturation	1.13	(.41, 3.17)	1.07	(.36, 3.17)	1.21	(.41, 3.52)	1.34	(.41, 4.39)
3. Mexican American Acculturation	3.04†	(.81, 11.39)	2.7	(.73, 9.98)	1.40	(.42, 4.65)	1.00	(.28, 3.57)
4. Anxiety Sensitivity	1.00	(.95, 1.05)	1.00	(.95, 1.06)	0.98	(.93, 1.03)	0.98	(.93, 1.04)
4. Trait Anxiety	1.04	(.99, 1.10)	1.02	(.97, 1.09)	1.07*	(1.01, 1.13)	1.07†	(1.00, 1.13)
5. Positive History of PNRV			4.02*	(1.37, 11.81)			--	--
5. Negative History of PNRV			REF	REF			--	--
5. Positive History of ATQ							4.31**	(1.44, 12.90)
5. Negative History of ATQ							REF	REF
χ^2 (*df*, *df*)	8.74 (1,7)		15.61 (1,8)*		11.96 (1, 7)		19.41 (1, 8)*	
N	82		82		82		82	
Nagerlkerke R^2	0.14		0.23		0.18		0.28	
−2 Log Likelihood	102.54		95.66**		99.32*		91.87**	

Note.

$^{\dagger}p<.10$,

$^{*}p < 0.05$,

$^{**}p < 0.01$,

$^{***}p < 0.001$

Hosmer and Lemeshow Goodness of Fit Test indicated good fit for all Models

Table 4

Summary of Linear Regression Analyses for Variables Predicting Psychological Distress (N = 82)

	Model 3		Model 4		Model 5	
Step/Variable	**B (SE B)**	**β**	**B (SE B)**	**β**	**B (SE B)**	**β**
Constant	−.57 (.34)		−.58 (.34)		−.64 (.33)	
1. Age	−.01 (.01)	−0.09	−.01 (.01)	−0.09	−.01 (.01)	−0.07
1. English Proficiency (BEST)	−.00 (.00)	−0.09	−.00 (.00)	−0.09	−.00 (.00)	−0.08
2. Acculturative Stress	.05 (.02)	0.21*	.05 (.02)	0.21*	.04 (.02)	0.19*
3. Anxiety Sensitivity	.01 (.01)	.26**	.01 (.01)	.26**	.01 (.00)	.28**
3. Trait Anxiety	.03 (.01)	.48***	.03 (.01)	.47***	.02 (.01)	.43***
4. Positive History of Ataques			.01 (.02)	0.02	−.01 (.02)	−0.04
5. Positive History of Nervios					.06 (.02)	.20*
F (*df1*, *df2*)	21.42 (5, 76)***		17.63 (6, 75)***		16.99 (7, 74)***	
N	82		82		82	
R^2	0.59		0.59		0.62	
ΔR^2	.17***		0.00		.03*	

Note.

* $p<0.05$,

** $p < 0.01$,

*** $p < 0.001$

Table 5

Summary of Linear Regression Analyses for Variables Predicting Acculturative Stress

	Model 1		Model 2		Model 3		Model 4	
Step/Variable	**B (SE B)**	**β**	**B (SE B)**	**β**	**B (SE B)**	**β**	**B (SE B)**	**β**
Constant	10.39 (1.86)***		9.20 (1.64)***		6.48 (1.78)***		5.96 (1.82)	
1. Age	.07 (.05)	0.15	.04 (.05)	0.10	.05 (.04)	0.12	.06 (.05)	0.14
1. English Proficiency (BEST)	−.01 (.02)	−0.07	−.02 (.02)	−0.08	−.02 (.02)	−0.11	−.02(.02)	−0.11
2. Anxiety Sensitivity			.11 (.02)	0.50***	.08 (.02)	.36***	.08 (.02)	.36***
3. Trait Anxiety					.08 (.03)	.32**	.07 (.03)	.28**
4. Positive History of Ataques							.06 (.13)	0.05
4. Positive History of Nervios							.14 (.13)	0.11
F (*df1*, *df2*)	.85 (2, 79)		9.10 (3, 78)***		10.11 (4, 77)***		7.02 (6, 75)***	
N	82		82		82		82	
R^2	0.02		0.26		0.34		0.36	
ΔR^2			0.24***		.09**		0.02	

Note.

† $p<.10$,

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$