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## **Anxiety, Stress, and Health in Northern Plains Native Americans**

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### **Abstract**

In the present study, the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988), Anxiety Sensitivity Inventory (Peterson & Reiss, 1992), the Holmes-Rahe Social Readjustment Rating Scale (Holmes & Rahe, 1967), Northern Plains Bicultural Inventory (Allen & French, 1994), and a health questionnaire were administered to investigate the relationship between anxiety, stressful events, health, and cultural participation among 147 Native American adults from a Midwestern reservation community. The results of these self-report measures indicated that, as has been found in the majority culture, stressful life events predicted physical health problems and self-reported anxiety. The hypothesis that participation in and identification with tribal culture would be associated with fewer life stressors, better health, and lower anxiety was not supported. Surprisingly, cultural identification did not buffer the relationship between stressful life events and anxiety. Implications for understanding anxiety and stress among Native Americans are discussed.

Recently, efforts to incorporate cultural components into service delivery have begun to take hold in practice and research. Graduate education programs are directing their efforts toward recruitment and retention of ethnic minority students (Levant, 2000). Nevertheless, American Indian and Alaska Native psychologists compose a meager 0.2% of all psychologists (US Department of Health and Human Services, 1999). The number of Native American people relative to the number of Indian psychologists suggests that it is highly likely

that American Indians seeking mental health services will encounter a non-Indian therapist. This underscores the imminent need for psychologists capable of providing culturally appropriate assessment and treatment to Native American people.

In 1980 Native Americans composed approximately 0.63% of the total US population, or approximately 1.45 million. Native Americans have been reported to be one of the fastest-growing minority populations, and more recent estimates (2000) recorded the American Indian population to be approximately 2.45 million (US Bureau of Census, 2000). These statistics demonstrate an increase of nearly 69% over a period of 20 years.

Large within-group differences found among Native American Indians further complicate the efficacy of current mental health services. Some authors (e.g., Norton & Manson, 1996) contend that the enormous differences that exist within Native American populations exceed between-group differences with the majority culture. The variance becomes clear when one considers the 510 federally recognized (Bureau of Indian Affairs, 1991) and 365 state-recognized indigenous entities (Manson & Trimble, 1982) that are vastly dispersed throughout the United States and Alaska. Mental health providers must be aware of tribal distinctions in clothing, food, shelter, ceremonies, and language (Allen, 1998).

Despite the lack of providers who identify themselves as Native American or have experience with this population, there is evidence of high need for mental health services among Native Americans (Dick, Manson, & Beals, 1993). Some studies suggest that as many as 40% to 50% of Native American adults and children have experienced an emotional disorder at some point in their lives (Beiser & Attneave, 1982; Mason, Tatum, & Dinges, 1982). Anxiety, substance abuse, and depression are among the most commonly observed problems in American Indian and Alaska Native people (Maser & Dinges, 1993; Nelson, McCoy, Stetter, & Vanderwagen, 1992; Walker, Lambert, Walker, & Kivlahan, 1993). Unfortunately, this psychopathology is poorly understood because of limited research on Native Americans (McNeil, Porter, Zvolensky, Chaney, & Kee, 2000).

Anxiety disorders, common mental health problems in the general population, may be so among Native Americans as well (Greenberg et al., 1999). Although the cause of anxiety is not entirely understood, substantial research among European Americans suggests that an individual's anxiety increases with the presence of stressful situations. Several studies (Finlay-Jones & Brown, 1981; Newman & Bland, 1994; Roy-Byrne, Geraci, and Uhde, 1986) reveal that a high percentage (80% to 90%) of individuals experience significant stressors prior to the onset of their anxiety disorder.

Elevated life stressors are associated with various physical health problems for Caucasian Americans (Coleman, Friedman, & Burright, 1998; Parveen & Singh, 1994). In general, stressors are thought to lead to negative affective states, such as anxiety and depression, which in turn increase risk of disease (Cohen & Williamson, 1991). Anxiety and depression interfere with healthy coping behaviors and may suppress immune functioning, leading to increased risk of disease (Cohen & Williamson).

Lazarus and Folkman (1984) addressed the conditions under which environmental factors can lead to stress, such as when a society's "survival-related demands" and travel and living constraints outweigh their available resources. For instance, simply having access to money increases available coping options such as having easier access to medical facilities and psychological services. Studies on perceived control indicate that when an individual

is unable to establish a sense of control over his or her circumstances, they are significantly more likely to experience anxiety symptoms (Nunn, 1988; Rapee, Craske, Brown, & Barlow, 1996). In a similar vein, Seligman (1975) proposed that repeated exposure to stressful events, coupled with negative attributional style, often leads to feelings of helplessness.

Native Americans are among the most impoverished groups in the United States. Many Native American families live in poverty, with inadequate food, housing, and health care (LaFromboise, 1988; Nelson et al., 1992). Throughout history Native American tribes have been subject to federal law and regulations without input or consideration for their needs or desires (Getches, Wilkinson, & Williams, 1998). Prolonged exposure to economic hardships, coupled with limited control over circumstances, has left many Native Americans feeling hopeless and helpless (Bigfoot, 2000; Duran & Duran, 1995).

As noted, Native Americans living on the reservation experience high rates of stressors, including substance abuse, poverty, unemployment, loss of traditional values, and political turmoil. Most reservation settings lack resources for addressing these threatening situations and produce environments that are unresponsive to the person's repeated coping efforts. When one considers the numerous environmental constraints and paucity of resources in Native American communities, it is not surprising that Native Americans experience significant distress (LaFromboise, 1988; Price & McNeil, 1992) and that their mental and physical health remains poor compared to all other races within the United States (Indian Health Service, 2002). Taken together, these data suggest the role of stressful life events as an intensifier and/or antecedent of anxiety and health problems among Native Americans.

Additional factors, such as history of oppression and discrimination, may also play a role in Native American people's anxiety. For example, McDonald, Jackson, and McDonald (1991) hypothesized that American Indian college students' higher self-reported anxiety relative to their non-Indian counterparts may be a product of the differences in values, beliefs, and prejudices American Indian students encounter in majority culture institutions. This may also be true of the elevated levels of anxiety sensitivity, a possible risk factor for panic disorder, found among Native American college students (Zvolensky, McNeil, Porter, & Stewart, 2001).

On the other hand, certain aspects of Native American culture may help to defend against stress. For instance, a traditional Native person's failure to participate in cultural activities and religious practices may indicate depression or significant emotional distress, implying that participation in these events may protect him or her emotionally. Moreover, several authors argue for the effectiveness of psychological interventions that include traditional beliefs and values (Dana, 1998; Garret & Garret, 1994; Matheson, 1996). Thus, it seems reasonable to assume that cultural participation may act as a buffer to stress. Despite the recognition that cultural identification may markedly affect emotional functioning (Oetting & Beauvais, 1991), few attempts have been made to examine the relationship between the two constructs, and even less is known about cultural identification as it relates to anxiety.

According to the Orthogonal Theory of Biculturalism (Oetting & Beauvais, 1991), one can function competently in more than one culture, without loss of original cultural identity. The more culturally competent one is in both the native and majority cultures, the

more successful and well-adjusted he or she will be. The Northern Plains Bicultural Inventory (NPBI; Allen & French, 1994) assesses cultural identification using the Orthogonal Theory of Biculturalism. It is a 30-item measure with three subscales: American Indian Cultural Identification, European American Cultural Identification, and Language. Despite some concerns about the makeup of the subscales (McDonald et al., 2001), the NPBI appeared to be the best available scale for measuring cultural identification and was used in the present study to assess the cultural identification as a possible buffer for the effect of stressors on anxiety and health.

In summary, anxiety disorders are among the most common mental health problems, yet little is known about anxiety in Native American people. Among European Americans, substantial research suggests that anxiety symptoms increase when an individual is under stress. The high incidence of stressors encountered by Native Americans on the reservation is expected to lead to high levels of anxiety and reduced health. However, identification with Native American culture may buffer these effects.

This study investigated the relationship between self-reported anxiety, stressful events, health, and cultural identification among Native Americans from a rural community in northeastern Nebraska. It was hypothesized that participants for the present study would show significant levels of anxiety. Also, it was hypothesized that greater life stressors and poorer health would be associated with increased anxiety. These effects might be buffered by cultural identification.

## **Method**

### *Participants*

Fifty men (age  $M = 36.39$  years,  $SD = 13.12$ ) and 95 women (age  $M = 35.74$  years,  $SD = 11.50$ ) identifying themselves as Native American participated in the study. For the purpose of this study, "American Indian" status was established through either reported enrollment in a federally recognized tribe or reported family lineage and community recognition. Approximately 82% of the sample indicated they were from the same tribe.

### *Procedure*

Data were collected during the course of one day at the annual health fair on a reservation in Nebraska. Participants were invited to participate in a study entitled "Stress, Health and Coping." Specifically, participants were told that the primary author was a Native American student at the University of Nebraska conducting a study on how stress may affect their health and how they cope with stress. Participants were further told they would receive \$5.00 for their participation in the study. They were then shown how to fill out each questionnaire and instructed to ask an available research assistant if they had any questions or difficulty with the measure. Approximately 10% of the sample required additional assistance, such as reading the questionnaire because of poor eyesight. The research assistants were five tribal college students who were members of the community. Informed consent was obtained, and participants voluntarily completed the questionnaire in the health fair setting. Debriefing included a handout thanking participants for their time and providing them with referral information for local and university mental health services.

Approximately 30 minutes were required to complete the questionnaires. The health fair is a community event attended by the vast majority of the community.

### *Measures*

All self-report measures used in the study were standard questionnaires, commonly used with majority samples with the exception of the demographic and health questionnaire.

The Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988; Beck & Steer, 1993) is a 21-item standard self-report measure of anxiety that assesses the frequency of a range of anxiety symptoms. Items are rated on a 4-point scale, ranging from 0 (*not bothered at all*) to 4 (*severely bothered*). The items are totaled for the final score. The BAI has a high internal consistency, with Cronbach's coefficient alpha of .92 (Beck et al., 1988). Cronbach's alpha was .93 for the present sample.

The Anxiety Sensitivity Inventory (ASI; Peterson & Reiss, 1992; Reiss, Peterson, Gursky, & McNally, 1986) is a commonly used measure that assesses concern about the experience of various symptoms and emotions. The ASI consists of 16 items that are rated on a scale of 0 (*very little*) to 4 (*very much*). Total scores are computed by summing across all items. Research on the ASI (McNally, 1994) has supported its validity and reliability. The factor structure and internal consistency of the ASI were recently evaluated in a sample of American Indian college students (Zvolensky et al., 2001). Findings were commensurate with previous research and demonstrated high levels of internal consistency for the entire scale. For the present sample, Cronbach's alpha was .93. Factor analyses did not replicate previously identified subscales, so only the total score was used for these analyses.

The Holmes-Rahe Social Readjustment Rating Scale (Holmes & Rahe, 1967) assesses the occurrence of various stressful life events over the past year. The scale consists of 43 items and has been associated with the onset of physical illness. Traditionally, the scale is used to calculate the amount and duration of change in one's life as well as the intensity of various life events. However, for the purpose of this study, intensity of life events was not assessed. To simplify administration, some minor revisions were made in the original wording to facilitate understanding. For example, for the event "pregnancy" a parenthetical explanation specifying "yourself or your spouse" was added; "in-law troubles" was changed to "trouble with in-laws"; "older sister moving in" was changed to "relative moving in"; "reconciliation with mate" was changed to "got back together with mate"; and so forth. Respondents indicated which events occurred for them over the past year by checking either "yes" or "no" to the corresponding item. Scores were obtained by aggregating "yes" responses.

The NPBI (Allen & French, 1994) is a 30-item questionnaire designed to assess cultural competence for both the Northern Plains American Indian culture and European American culture. The NPBI yields three subscales: (a) American Indian Cultural Identification (AICI), (b) European American Cultural Identification (EACI), and (c) Language. Six-month follow-up data indicate acceptable test-retest reliabilities for all three subscales. The factor structure of the scale has varied across samples. Although a median split procedure can be used to categorize participants as traditional, assimilated, bicultural, or marginal in cultural identification, raw subscale scores were used in the present study. For the present study, the Community Version 4.2 of the NPBI was used.

The Health Questionnaire was designed to assess various health problems and self-perception of overall health. By checking the corresponding box, participants indicate which of the 13 listed difficulties they had had in their lifetime (ongoing stomach/intestinal problems, arthritis, heart attack or other heart problems, high blood pressure, stroke, asthma, other lung problems or diseases, cancer, diabetes, mental or emotional problems, alcohol problems, drug abuse, other health problems). Scores were obtained by adding the total number of marked items. Seventeen respondents indicated they had mental or emotional problems. Given this small sample size, this group was not analyzed separately. Additionally, respondents indicated their perception of their own physical health by using a single Likert scale (1 = *much less healthy than most people*, 7 = *much more healthy than most people*).

The demographics form assessed a participant's age, gender, marital status, tribal affiliation, whether the participant was currently living on the reservation, number of years living off the reservation, and education.

## Results

### *Preliminary Analyses*

Preliminary analyses revealed that 88.4% of the sample was living on the reservation at the time of the study. Fifteen individuals indicated they had never lived off the reservation. Thirty-six percent indicated that they were married/cohabitating, 34% indicated they were single/never married, 16% said they were divorced/separated, and 5% said they were widowed. Fifty-one percent of the sample participants indicated they had attended a public school, while 13% said they attended only a tribal school, and the remaining 28% indicated they had attended both a public and tribal school.

Table 1 displays the primary variables by gender. The results indicate that women had significantly higher ASI scores than men. These results are consistent with previous findings (Zvolensky et al., 2001) in which ASI scores for men ( $M = 16.2$ ,  $SD = 10.3$ ) and women ( $M = 18.7$ ,  $SD = 10.4$ ) were compared in a Native American and Alaska Native college student sample. Both Zvolensky et al. and this study replicate majority culture findings from the normative ASI sample (Stewart, Taylor, & Baker, 1997) that indicate higher ASI scores among women ( $M = 17.1$ ,  $SD = 8.7$ ) when compared to men ( $M = 13.1$ ,  $SD = 8.7$ ). These findings provide additional support for research that shows women tend to experience higher levels of fear and anxiety sensitivity overall (Stewart & Baker, 1999). Using *t* tests for independent samples, no significant differences (all  $ps > .05$ ) on ASI scores were found when the present sample was compared to ASI data for college students (Zvolensky et al.) and to ASI normative data (Stewart et al., 1997). No significant mean differences by gender were observed on any other variables.

**Table 1.** Means and standard deviations by gender for health, anxiety, life events, and cultural identification

	Mean (SD)			$\eta^2$
	Men	Women	Overall	
Total health problems	1.42 (1.54)	1.49 (1.50)	1.47 (1.51)	.00
BAI	5.89 (7.07)	8.90 (9.75)	7.82 (8.96)	.03
ASI	13.94 (8.71)	19.12 (13.24)*	17.26 (12.04)	.04
Event total	10.30 (6.75)	11.93 (6.58)	11.41 (6.65)	.01
Age (years)	36.39 (13.12)	35.74 (11.50)	35.97 (12.06)	.00
Perceived health	4.62 (1.11)	4.40 (1.37)	4.48 (1.28)	.01
NPBI-EA	32.90 (6.82)	33.07 (6.63)	33.01 (6.67)	.00
NPBI-AI	46.52 (7.70)	44.83 (7.07)	45.41 (7.31)	.01
NPBI-Language	14.68 (4.52)	12.42 (5.08)	13.13 (5.00)	.05

**Note:**  $N = 120$  to  $144$  due to missing data. BAI = Beck Anxiety Inventory-II; ASI = Anxiety Sensitivity Index; NPBI = Northern Plains Bicultural Inventory; EA = European American; AI = American Indian.

\*  $p < .05$

### *Correlations among Anxiety, Health, Stressors, and Cultural Identification*

Next we examined the zero-order correlations among stressful life events, anxiety, and health (see Table 2). As expected, more health problems were associated with poorer perceived health. Higher BAI and ASI scores were associated with poorer perceived health and more health problems. Total number of stressful life events was negatively related to perceived health and showed positive correlations with number of health problems, ASI, and BAI. Finally, participant's age was positively associated with number of health problems. With regard to NPBI subscales, a greater association between European American Identification was associated with better health. The Language subscale was negatively correlated with total number of stressful life events. Surprisingly, the NPBI-EA and NPBI-AI scales showed a positive correlation with one another,  $r = .32, p < .01$ . As expected, the NPBI Language subscale was correlated with NPBI-AI,  $r = .35, p < .01$ , but not the NPBI-EA,  $r = .13, ns$ .

**Table 2.** Correlations for anxiety, health, and Holmes and Rahe life events

	Perceived Health	Total Health Problems	BAI	ASI	Event Total
Total health problems	-.21*				
BAI	-.23**	.44**			
ASI	-.20*	.27**	.50**		
Event total	-.26**	.21*	.47**	.32**	
Age (years)	-.09	.38**	.09	.12	.14
NPBI-EA	.18*	-.11	-.02	-.02	-.06
NPBI-AI	.05	-.01	-.01	.00	.01
NPBI-L	.15	.06	-.09	-.08	-.18*

**Note:**  $N = 120$  to  $144$  due to missing data. BAI = Beck Anxiety Inventory; ASI = Anxiety Sensitivity Index; NPBI = Northern Plains Bicultural Inventory; EA = European American; AI = American Indian; L = Language.

\*  $p < .05$ , \*\*  $p < .001$

**Multiple Regression Predicting Anxiety Scores**

Regression analyses were conducted to examine whether the relationship between stressful life events and anxiety was buffered by cultural identification, after controlling for overall health.<sup>1</sup> For the first regression with BAI as the dependent variable, overall health was entered in the first step,  $R^2 = .19$ ,  $p < .001$ . Total life events scores, NPBI-EA and NPBI-AI were entered in the second step,  $R^2$  change =  $.15$ ,  $p < .001$ , but only total life events made a significant contribution. The interactions between life events and NPBI-EA and life events and NPBI-AI were entered next but neither contributed to the regression,  $R^2$  change =  $.001$ , *ns*. See Table 3 for the full statistics.

**Table 3.** Regression of BAI with stressful life events and NPBI subscales controlling for health problems

Model	Effect	B	Beta	<i>t</i>	<i>p</i>
1	Total number of health problems	2.61	.44	4.97	.001
2	Total number of life events	3.52	.39	4.73	.001
	NPBI-EA	.45	.05	.58	.56
	NPBI-AI	-.18	-.20	.24	.81
3	Interactions				
	Life events × NPBI-EA	.00	-.009	.09	.92
	Life events × NPBI-AI	-.27	-.03	.29	.77

**Note:**  $N = 113$  to  $144$  due to missing data. BAI = Beck Anxiety Inventory; NPBI = Northern Plains Bicultural Inventory; EA = European American; AI = American Indian.

In parallel analyses with ASI as the dependent variable, overall health was entered in the first step,  $R^2 = .07$ ,  $p < .005$ , total life events, NPBI-EA and NPBI-AI were entered in the second step,  $R^2$  change =  $.07$ ,  $p < .037$ . As in the previous analysis, total life events, but not the NPBI subscales, made a significant contribution. The interaction between life events and NPBI-EA and life events and NPBI-AI were entered in the third step but did not account for additional variance,  $R^2$  change =  $.003$ , *ns*. See Table 4.

**Table 4.** Regression of ASI with stressful life events and NPBI subscales controlling for health problems

Model	Effect	B	Beta	<i>t</i>	<i>p</i>
1	Total number of health problems	2.13	.27	2.69	.005
2	Total number of life events	3.23	.27	2.96	.004
	NPBI-EA	.27	.02	.23	.82
	NPBI-AI	.00	-.01	.06	.95
3	Interactions				
	Life events × NPBI-EA	-.37	-.03	.29	.78
	Life events × NPBI-AI	-.47	-.04	.34	.78

**Note:**  $N = 113$  to  $144$  due to missing data. ASI = Anxiety Sensitivity Index; NPBI = Northern Plains Bicultural Inventory; EA = European American; AI = American Indian.

## Discussion

The hypothesis that respondents would, on average, show high levels of anxiety on both ASI and BAI was not supported. As noted earlier, no significant differences were found when men's and women's mean ASI scores for this study were compared to Zvolensky et al. (2001) and Stewart et al. (1997). According to norms established by Beck and Steer (1993), the BAI scores are well within the mild range. Although Zvolensky and colleagues described their scores as somewhat elevated, ASI scores for the present study did not suggest clinically significant anxiety. The low self-reported anxiety on both measures was surprising given the high societal stressors in the reservation community and previous work with college students (McDonald et al., 1991; McNeil et al., 2000).

A number of possible explanations may account for these results. The first may be that despite their living conditions, participants were not experiencing high anxiety due to various protective factors such as participation in cultural activities. The multiple regressions, however, do not support this hypothesis, as described below. Second, ASI and BAI may not successfully assess the expression of anxiety in this culture if the Native American experience of anxiety may not be "anxiety" as defined by mainstream psychology. A similar issue has arisen in cross-cultural studies of depression (Beals, Manson, Keane, & Dick, 1991; Radloff, 1977; Katon, Kleinman, & Rosen, 1982). Some researchers argue that certain cultures possess an inclination to report somatic rather than psychological symptoms, while others believe that differences result because non-Western cultures do not distinguish between physical and emotional symptoms, relating to the concept of mind-body dualism (Manson, 1995). Future research should consider the conceptual frameworks that may explain culture-specific anxiety phenomena for Native Americans.

As hypothesized, individuals with a higher number of reported health problems tended to have higher anxiety as measured by the ASI and BAI. Similarly, participants indicating more stressful life events and more health problems reported more anxiety. Individuals who perceived themselves as less healthy than other people reported higher anxiety, more stressful events, and more health problems. As expected, as participants' ages increased, so did their total number of health problems.

The positive relationship between the European American subscale of the NPBI and perceived health may indicate a more optimistic perception of health for participants more strongly identifying with the European American culture. Perhaps individuals with low European American identification expect they will experience many of the health difficulties that are commonly observed in Indian communities and therefore perceive themselves as less healthy than other people. Manson (1995) described a Native American "sociocentric" locus of control in which the person identifies himself or herself in terms of his or her tribal or community membership. This is different from the "egocentric" concept of Western society that defines the individual as an independent entity. With Native Americans' focus on the larger community rather than on the self, symptoms may commonly result from troubles occurring within their community or disappointment as a result of their perceived inability to provide support for community members.

It was hypothesized that higher Native American cultural identification would reduce the association between stressful life events and anxiety. We controlled for the effects of

overall health because we were interested in life events beyond health problems, which were themselves related to the anxiety measures. Surprisingly, none of the interactions between Native American and European American cultural identification and stressful life events predicted general anxiety or anxiety sensitivity. Both conceptual and measurement issues may explain the failure to support this hypothesis.

Although clinicians widely believe cultural activities moderate the effect of life stressors (e.g., Dana, 1998), this may not be true, particularly on an extremely poor, rural reservation. Before drawing this conclusion, however, limitations in the measurement of both cultural identification and stressful events must be considered. As outlined below, both the NPBI and Holmes-Rahe scales may have been less precise, and perhaps less valid, than had been hoped at the onset of the study.

On the other hand, a negative relationship between the language subscale on the NPBI and total number of stressful life events was found. Theoretically, knowledge and usage of traditional language measures identification with the American Indian culture (Allen & French, 1994). These findings suggest that respondents who had higher levels of language immersion, and therefore more strongly identified with the American Indian culture, reported fewer stressful life events. However, these results should be interpreted with caution in light of NPBI scale limitations (described below).

The high correlation between NPBI-EA and NPBI-AI subscales concurs with findings from McDonald et al. (2001) and Allen and French (1994). While the authors of the scale offer no explanation for the conceptual overlap, McDonald and colleagues suggested that this relationship is both theoretically and practically problematic and calls into question the utility of the scale. In order to test the limits of the scale, we conducted exploratory analyses to see if a more coherent factor structure could be identified. Although somewhat more internally consistent, the revised factors resulted in a similar pattern of results and thus were not reported.

There are implications for standard anxiety measures as appropriate assessment tools for American Indian people in these data. There is some evidence that the BAI and ASI total score are assessing anxiety in this population. The relationship between the ASI and BAI and the health and life event variables are in the expected direction, supporting the validity of the scales. Furthermore, previous findings (Zvolensky et al., 2001) of the ASI on a Native American sample were consistent with findings from majority culture samples (Stein, Jang, & Livesly, 1999; Stewart et al., 1997; Zinbarg, Barlow, & Brown, 1997) showing consistent internal validity and a three-factor structure solution. As noted above, exploratory analyses for the present study revealed an ASI factor structure that was inconsistent with Zvolensky et al. (2001) and the original study (Reiss et al., 1986). We are currently exploring the ASI further in another study to help resolve this discrepancy. As in majority culture samples (Peterson & Reiss, 1992), women had higher ASI scores than men. Unlike majority culture samples (Beck & Steer, 1993), BAI scores did not differ by gender. However, McNeil, Kee, and Zvolensky (1999) also reported no difference by gender for culturally related anxiety among a sample of Navajo college students.

Several limitations should be considered when interpreting the results of this study. First, large variations exist among American Indian tribes; therefore, these results can be interpreted only with regard to Plains Indians. Second, self-report participants' reading

abilities and unfamiliarity with standardized assessment measures may have affected scores. As mentioned, wording and structure of several scale items were altered to facilitate comprehension. However, during study administration it became apparent that many of the respondents had difficulty understanding questions and/or scale format. On Likert items, several participants responded by circling both the scale number and the conflicting item. For instance, a participant would circle 1 (which indicates *not at all*) and the words *very much*. Many authors (Allen, 1998; Dana, 1996; Davis, Hoffman, & Nelson, 1990; Malgady, 1996) argue that utilization of standardized assessment measures, which include European American content and language, may result in unreliable outcomes for Native American respondents. This may be particularly true of rural reservation sample respondents who have little experience with standardized response formats such as the Likert scale.

Future research should include multimodal assessment, such as medical tests, in addition to self-report strategies to determine the presence and relative severity of physical health problems. Similarly, the use of experimental methodologies from cognitive science might be helpful in decreasing the problems associated with language-based reporting biases in cross-cultural research.

It is also important to address the applicability of the Holmes and Rahe assessment measure used in this study. Initially, researchers from the present study believed it to be an appropriate tool for this sample. However, after becoming more acquainted with the community from which this sample was extracted, many of the items seemed less relevant than previously thought. The majority of members within this small reservation community frequently report worries regarding more basic survival needs such as adequate food, clothing, housing, transportation, health care services, and appropriate employment and education for themselves and their children. Individuals within this community rarely have the opportunities for items that suggest changes in their environment (i.e., changing school, work, or recreation). Anxieties about vacations and making major purchases are infrequent options, and petty worries like revisions of personal habits seem irrelevant. Their apparent ability to disregard minor events may be thought of as a sort of resiliency, which may play a role in their survival. Life events scales can be made more applicable to Plains Indians by including items relevant to their environmental and social situation. One such scale has recently been developed. The Native American Cultural Involvement and Detachment Questionnaire (CIDAQ; McNeil et al., 2000) assesses acculturation anxiety as it relates to social involvement with Native Americans and cultural knowledge, economic issues, and social involvement with the Caucasian culture.

Another important limitation was the cross-sectional design that limits the ability to draw conclusions about the direction of the observed relationships between anxiety, health, and stressful life events. Indeed, we recognized the inherent problems with this approach prior to conducting the study. In light of the relative absence of empirical data for Native Americans and the intrinsic difficulties in accessing Native American populations for research, we felt that this approach would better facilitate completion of the study while providing important information for better understanding the nature of anxiety in Native American people.

In summary, this study provided evidence for the relationship between anxiety, stress, and physical health problems among Native Americans. The similarity of this relationship among both Native American and majority culture samples aids in our understanding of emotional and physical well-being for American Indian clients. Although theory suggests that stress precedes the onset of anxiety, the cross-sectional nature of this study precludes such a conclusion. Future research of longitudinal designs is needed.

Although these data are promising, the effectiveness of prevailing assessment and treatment approaches remains unclear. Consideration for cultural differences in the assessment, diagnosis, and treatment of emotional disorders in Native American Indians is essential. Dana (1998) provides an example of a multicultural assessment-intervention mode that includes assessment of the client's degree of cultural orientation to assist the clinician in obtaining an understanding of the client's value/belief system that encompasses their thoughts and feelings regarding mental illness and its symptoms. McDonald, Morton, and Stewart (1993) provide an alternative suggestion to Western-devised assessment practices. The process is similar to majority culture diagnostic interviews; however, the questions are asked and conceptualized in a tribal-specific manner. McDonald and colleagues' (1993) approach is similar to the explanatory model first proposed by Kleinman (1980). Kleinman suggests the therapist ask simple, open-ended questions relating to the illness and concerning the cause, timing, pathophysiological process, course of severity, and the type and length of treatment. He contends that employing this explanatory model helps the professional to understand the beliefs surrounding illness and serves to facilitate communication between the therapist and client.

This study further illuminated the need for more research among American Indian people as well as the need for culturally appropriate assessment devices. Careful interpretation of existing measures must be employed when used with minority populations. Until assessment tools developed specifically for Native Americans are validated, it is important that clinicians and researchers seek converging evidence, such as clinical interviewing, and consider assessment of community involvement, cultural participation, and consultation with family and tribal elders.

#### Note

1. At the suggestion of an anonymous reviewer, analyses were conducted both with overall health problems and with the three subsets (major/life-threatening problems, minor/non-life-threatening problems, and psychological difficulties). As the results were comparable, only results for total health problems were reported.

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