

LOCAL NORMS FOR POSTTRAUMATIC STRESS, GENERALIZED
ANXIETY, AND PROBLEM BEHAVIORS IN A TORNADO-PRONE
AREA: AN INVESTIGATION OF THE APPROPRIATENESS
OF NATIONAL STANDARDIZATION NORMS FOR
USE WITH DISASTER AND NATIVE
AMERICAN SAMPLES

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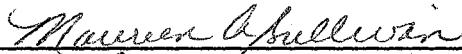
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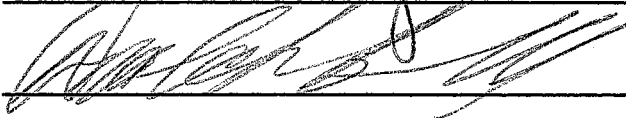
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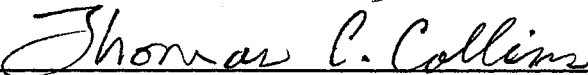


Thesis Advisor









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Child Reactions to Natural Disaster

In recent years, many researchers have examined the effects of natural disasters on children, including subjective reactions to the experience and reports by others in the children's lives describing changes in behavior and the development of psychiatric symptoms. Research has shown that a significant number of exposed children demonstrate a broad spectrum of measurable effects of psychological distress after a disaster. These effects, which are potentially negative and long-lasting, have been documented to range in prevalence from 12 to 75% of those children exposed to a disaster (Bloch, Silber, & Perry; 1956; Sugar, 1989). Reactions as diverse as avoidant anxiety responses, separation anxiety, overanxious reactions, depression, simple phobias, attention deficit disorder, and posttraumatic stress disorder have often been diagnosed in children directly exposed to a natural disaster (Bloch et al., 1956; McFarlane, 1987; Newman, 1976). Reported stress reactions and symptoms exhibited post-disaster have included recurrent dreams or intrusive recollections of the event, diminished interest in usual activities, sleep disturbance, and an increased frequency of headaches and stomach pains (Sugar, 1989). Increases in problem behaviors, including regressive behaviors and increased dependency, re-enactment of the traumatic experience (as evidenced by the playing trauma-related "games"), and avoidance of situations that represent the event have also been reported (Adams & Adams, 1984; Bloch et al., 1956; Frederick, 1985; Kolb & Mutalipassi, 1982; McFarlane, Policansky, & Irwin, 1987; Silber, Perry, & Bloch, 1957; Sugar, 1989). In general, the most commonly reported reaction is some form of anxiety reaction. Of these, posttraumatic stress disorder is the most cited.

These symptoms persist for quite some time after the trauma, for up to two to four years (Adams & Adams, 1984; Burke, Borus, Burns, Millstein, & Beasley, 1982; Frederick, 1985; Handford et al., 1986; Newman, 1976). Symptoms have been found to persist at high levels approximately one year after the traumatic event (Sullivan, Romero, & Hutchison, 1993). McFarlane et al. (1987)

found that morbidity did not become manifest until more than two months after a disaster. In fact, consistent increases in morbidity were found as late as 26 months afterward. This is strong evidence that many problems do not spontaneously resolve with time, and indicates that thorough assessment and early intervention may be necessary.

The severity of a child's reaction, in terms of number of symptoms as well as long-term adjustment, is reported to be influenced by a number of parent-related and other environmental factors. Silber et al. (1957) found that children's reactions to a tornado were largely determined by the presence or absence of the parent from the child at the time of the child's exposure. Similar results were found by McFarlane (1987). It has also been suggested that long-term adjustment has more to do with the reaction of the parents during and after the event than the child's direct exposure to the disaster (McFarlane, 1987; Silber et al., 1957).

Parent-related factors are not the only factors affecting child reactions, however. Disruption of a child's daily routine (such as not going back to the same school) or change of a child's environment can also have a significant negative impact on child reactions, with reactions becoming more severe with increasing intensity of disruption (Papanek, 1942; Silber et al., 1957; Terr, 1981).

Child-related variables, other than age, that may affect type and severity of reaction to disaster, have not been extensively studied. These variables include coping style and ethnicity. This lack of attention to coping style and ethnicity is inconsistent with other areas of research that have examined these as risk and protective factors influencing individual susceptibility to the development of psychiatric disorders. Coping style has been studied as a factor affecting the development of disorders such as depression, adjustment disorders, and PTSD, but has not been thoroughly examined in relation to child stress reactions after exposure to disaster. Disaster studies which have examined child coping strategies have found a wide variety in the type and the perceived efficacy of the strategies which are used by the individual to cope with disaster sequelae (Romero, 1991). It is very likely that the type and efficacy of strategies used by children post-

disaster affect the level of posttraumatic distress the children experience. This hypothesis has not yet been directly examined.

Ethnicity is another factor influencing development and course of psychiatric symptoms. Although ethnicity has been found to affect PTSD symptomatology in combat veterans (Green, Grace, Lindy, & Leonard, 1990; Penk et al., 1989), it has not yet been explored in child disaster research.

A number of methodological issues also affect the specific nature and prevalence of child reactions reported in the disaster literature. First, the samples vary in selection procedures (e.g., children receiving treatment vs. school populations), and are typically very small (Sullivan et al., 1993). Second, assessments have varied from focusing on meeting criteria for specific diagnoses to focusing on levels of symptoms and general stress reactions (Sullivan et al., 1993). Third, studies which utilize parents as informants often report different rates than those that use children in a self-report format. Lastly, studies have not used uniform assessment procedures. The time interval between exposure and assessment has varied extensively, which greatly affects level of reported symptomatology (Terr, 1981). Assessment methods have included projective drawings, unstructured interviews, structured interviews, and rating scales. Presently, most of the assessment has been conducted informally, relying heavily upon clinical impression and neglecting the use of well-researched and standardized objective measures. This deficiency in use of well-standardized measures is compounded by the lack of control groups for comparison.

The majority of research conducted has utilized parents as informants. These studies have typically reported rates of morbidity that fall at the low end of the 12 to 75% affected range. When both parent and child reports of child symptoms are collected, there is often poor parent-child agreement. Children endorse more symptoms and maintain a level of residual distress or symptomatology which is not present in parent reports (Handford et al., 1987; Romero, 1991; Sullivan et al., 1993). Because children may experience distress of which their parents are unaware, it is important to use children as well as parents as informants when conducting disaster research, unless the children involved are too young to provide accurate reports.

Studies which have focused on the presentation of general stress reactions or increased symptomatology have reported higher rates of prevalence than those studies which have focused on meeting criteria for a specific diagnosis (Romero, 1991; Sullivan et al., 1993). When assessing for PTSD symptoms, many more children are found to be affected than when assessing for major depression or generalized anxiety disorder. The development of PTSD symptoms is much more common than the presentation of symptoms that meet full criteria for diagnosis with any psychiatric disorder, such as major depression, overanxious disorder, etc. In fact, in those studies that do assess for PTSD symptoms, as many as 94% of children endorse symptoms, as compared to 10% when assessing for generalized anxiety disorder and 7% when assessing for depression symptoms (Romero, 1991; Sullivan et al., 1993).

The research is inconclusive with respect to the prevalence of post-disaster behavior disorders. Some studies assessing children's reactions post-disaster have documented increases in the intensity and/or frequency of problem behaviors after exposure to the traumatic event (Sullivan, Saylor & Foster, 1991). The results of these studies are equivocal, with some finding significant increases in problem behaviors whereas others have found increases in internalizing symptoms rather than externalizing symptoms such as behavior problems (Sullivan et al., 1993). Some data have shown an increase in child problem or regressive behaviors immediately after disaster (Sullivan et al., 1991, 1993; Sugar, 1989). However, much of the information was based on retrospective ratings or was collected in an anecdotal fashion. In some instances, behavior problems were informally observed rather than directly assessed. At present, behavior problems, as measured by standardized instruments, have been found only in studies which examined immediate short-term effects. For example, Sullivan et al. (1991) found increased behavior problems in preschoolers eight weeks after a disaster. However, Romero (1991) did not find increased behavior problems in a group of 8-11 year old girls 14 months post-disaster. It is unclear if the inconsistency in the behavior problem data is due to differences in methodology, age, or actual absence of long-term behavior problems. Therefore, behavior problems should also be assessed post-disaster, as their prevalence and persistence are not yet clear.

The extremely high prevalence rates of PTSD symptoms found in the Sullivan et al. (1993) and Romero (1991) samples are unusual when compared to the previously published rates of negative reactions that ranged from 12 to 75%. The high number of children demonstrating at least some level of PTSD symptoms could result from a combination of many factors. Type I or acute traumas, such as direct exposure to a tornado, are associated with increased probability of PTSD (Terr, 1981). Children in these samples experienced a high degree of initial exposure, and a great amount of disruption to their routines. In both samples, the schools as well as the homes of many children were directly hit, causing the schools to close six weeks early and many children to be displaced from their homes. The intensity of exposure and disruption could account for the higher prevalence and long duration of posttraumatic stress symptoms in these groups.

The high prevalence could also be a factor of the area in which the children resided. Subjects included in the studies of Romero (1991) and Sullivan et al. (1993) were children and adolescents residing in Oklahoma, an area sometimes described as "tornado alley." In this area, tornados are very frequent, occurring on average 52 times each year (U.S. Department of Commerce, 1991). The high frequency of tornados causes the chance of revictimization and/or re-exposure to be quite high. School tornado drills and the extensive media coverage of the tornados and damage emphasize the probability of revictimization, and thus may heighten tornado-related anxiety in these children. Children who have been directly exposed to a tornado and its devastation may in fact become sensitized to a recurrence, and show extreme anxiety, in the form of PTSD symptomatology. Data were collected by Romero (1991) and Sullivan et al. (1993) during tornado season (March through July) (U.S. Department of Commerce, 1991). This may have contributed to the unusually high rates of PTSD symptoms found in these samples.

Children not yet directly exposed to a tornado but who live in "tornado alley" may show some elevated baseline levels of tornado specific anxiety relative to residents in other areas of the country. This could lead to overall elevated PTSD symptomatology in residents of "tornado alley" as compared to national norms (reported for the Reaction Index; Pynoos et al., 1987). This elevation plus sensitization may create a floor effect in which children who have not been directly

exposed display mild to moderate PTSD symptomatology, and those children with direct exposure show even more extreme elevations, as evidenced by moderate to severe levels of symptoms (Romero, 1991; Sullivan et al., 1993). In order to determine if this elevation is in fact due to a sensitization effect or to severe traumatization caused by the tornados, local norms must be collected and compared to the national norms for prevalence of PTSD and other symptoms in children (Pynoos et al., 1987).

One complication arises when collecting data on children's reactions to natural disaster in Oklahoma. Many Native American children are represented within these samples, in numbers ranging from 5.3 to 10% (Romero, 1991; Sullivan et al., 1993). This presents difficulty, as Native American children are not represented in the normative bases of many widely used measures.

Hutchison, Sullivan, & Romero (1993), when assessing for PTSD, general anxiety, and problem behaviors one year after a tornado, found that Native American children reported significantly lower levels of PTSD symptoms, general anxiety, and social anxiety than did Caucasian children. No differences were found for physiological anxiety, worry/oversensitivity, and frequency or intensity of problem behaviors. These differences in scores across ethnic groups are presently difficult to interpret, as racial/ethnic differences are typically not examined in the disaster research. Another reason scores are impossible to interpret is that Native American children are either not included in normative samples for measures commonly used to assess adjustment post-disaster, or are included in such small numbers that their scores are not separately analyzed or reported (Reaction Index; Pynoos et al., 1987; Revised Children's Manifest Anxiety Scale; Reynolds & Richmond, 1985; Eyberg Child Behavior Inventory; Eyberg & Ross, 1978). Because of the lack of normative information for Native American children and the lack of focus on ethnicity in disaster research, it becomes important to gather preliminary normative data on Native Americans. This is necessary to properly interpret data collected in disaster research, as well as to interpret Native American performance on these questionnaires for other purposes in various settings.

Because of the lack of research on possible differences between Native American and Caucasian children, it is important to examine existing comparisons of these groups in a number of

relevant psychological domains, and to examine the factors that possibly mediate these differences. The following section will examine: the available literature on the psychological functioning of Native American children and any relevant differences from Caucasian and other minority children; and ethnic differences reported for instruments commonly used to assess child reactions to natural disaster. Next, the following section will summarize the literature on two factors that have been hypothesized to mediate performance on psychological measures: coping style, and ethnicity and acculturation.

Ethnic Differences in the Prevalence of Psychiatric Disorders

Native Americans are exposed to a number of environmental risk factors for mental health problems, such as unemployment, poverty, substance abuse, physical illness and death. These factors are often associated with psychiatric disturbance in adolescents and children. Clinical experience suggests that most DSM-III-R psychiatric disorders are represented at least as frequently among American Indian adolescents as in the population at large (Indian Adolescent Mental Health, U.S. Congress, Office of Technology Assessment, 1990). Research and clinical experience suggests that some disorders occur more frequently within native populations, such as mental retardation, developmental disorders, posttraumatic stress disorder, and adjustment disorders, while some disorders, such as anorexia and bulimia nervosa occur less frequently (Indian Adolescent Mental Health, U.S. Congress, Office of Technology Assessment, 1990). Indian children and adolescents enter the mental health treatment system at rates higher than those found for other ethnic groups (except for ages 5-9, which enter at a lower rate) (Beiser & Atneave, 1982; McShane, 1988). Native American children between the ages of 10-14 are 1½ to 2 times more likely than the general population to be referred for treatment, and by age 15, the rate rises to 3½ to 5 times greater than non-Indians (McShane, 1988).

Accurate prevalence rates are undetermined. American Indian adults and children have never been systematically included in any national epidemiological survey, and epidemiological studies done thus far have had a number of limitations (Indian Adolescent Mental Health, U.S. Congress, Office of Technology Assessment, 1990; Beiser, 1981). These limitations include questionable

diagnostic methods, limitations in the number of tribes studied, and assessment materials that have not been shown to be sensitive to the culturally specific ways in which emotional distress may be expressed among American Indian children (Indian Adolescent Mental Health, U.S. Congress, Office of Technology Assessment, 1990; Beiser, 1981). The largest gaps occur in the examination of conduct disorder, fears and other affective disorders (McShane, 1988).

Prevalence of Anxiety Disorders

Various prevalence rates of anxiety disorders have been reported for whites, ranging from 2 to 8% (Green, Sack, & Pambrun, 1981). The frequency in Native Americans is not congruent. Beiser and Attneave (1982; as cited in Indian Adolescent Mental Health, 1990) state that anxiety was the fourth most common mental health problem seen through the Indian Health Services Mental Health programs in 1974. The authors reported that 8% of all Native American children ages 15-19 had some form of anxiety disorder. Another source, the National Center for American Indian and Alaska Native Mental Health Research (1989), found remarkably high levels of different forms of anxiety among adolescents, ranging from 11.3 to 13%. In contrast, no children under age 15 were seen by Indian Health Services Mental Health Branch for problems of anxiety during the same time period (Beiser & Attneave, 1982). These data are further limited by the infrequency with which young children were included in reported epidemiological studies.

Prevalence of Behavior Disorders

Behavior or conduct disorders are frequently occurring child disorders, both in terms of prevalence in the general population and referrals for treatment (McMahon & Wells, 1989). The prevalence of behavior disordered children in the population at large is around 4% (McMahon & Wells, 1989). Rates of behavior disorder in Native American children are difficult to determine, as they have not been included in many normative studies, and prevalence studies conducted solely with Native Americans have focused mainly on juvenile delinquency and alcohol related offenses in the adolescents.

Forslund and Meyers (1974; as cited in Green, et al., 1981), in summarizing previous research, indicated a relatively high delinquency rate in the American Indian population, but with a

preponderance of petty offenses and misdemeanors. The rate of 12 court appearances per 100 adolescents was much higher than that of 2.5 for the majority population; however, when alcohol related offenses are factored out, delinquency rates are similar among races.

Studies of problem behaviors have found marked differences between ethnic groups, with ethnicity explaining up to 5% of problem behavior variance in clinical samples in which black and Hispanic minority children score much higher than whites (Sandberg, Meyer-Bahlberg, & Yager, 1991). It is unclear whether these measured differences reflect true ethnic differences in the rate of problem behaviors, reflect less tolerance and subsequent over-reporting of deviant behavior within the minority groups, or reflect a higher threshold for seeking mental health services (Sandberg et al., 1991). It is also unclear how Native Americans would compare to these ethnic groups.

Prevalence of Posttraumatic Stress Disorder

Few or no studies have examined the presentation or prevalence of PTSD in Native Americans. No studies thus far have examined development of PTSD in Native Americans after exposure to a natural disaster. Research examining this disorder in Native Americans has focused on the experiences of children who have been subject to traumatic losses of family members and friends with a much higher frequency than children in the majority population have experienced (McShane, 1988). In response to these losses, McShane (1988) reports that the children have responded with interpersonal distancing and isolation without anger. While there is some anecdotal information of the development of PTSD in these children, actual prevalence rates of PTSD have not been reported or systematically examined.

While the effects of ethnicity on the development of PTSD in children have not yet been examined, some preliminary research has been conducted with Vietnam Veterans. Penk et al. (1989) found that minority group status predicted poorer post-war adjustment and higher rates of PTSD for Blacks than for Whites. However, ethnicity and minority group status only contributed in selected instances, as Hispanics scored more like Whites than like Blacks. The presence of ethnic differences would suggest that there may be some differences in children as well.

In general, research concerning psychopathology in Native American children is relatively scarce and of questionable accuracy. There are no definitive data on the prevalence of psychiatric disorders in Native Americans. Given the differences in prevalence of psychiatric disorders reported between Native Americans and the general population, differences in psychiatric prevalence rates are expected for disaster samples. At this point, the direction of this difference is unknown. Because Native Americans are exposed to many of the factors that lead to increased risk of pathology, accurate assessment procedures are needed for this group. Before reliable and valid assessment can be provided, research on existing assessment measures is necessary to determine that these measures have adequate normative data, are unbiased, and are applicable to Native American populations.

The following section will review ethnic differences in performance on questionnaires that are frequently used to assess child post-disaster adjustment. This review will include ethnic performance on the Revised Children's Manifest Anxiety Scale, the Eyberg Child Behavior Inventory, and the Reaction Index. Performance on intelligence tests will also be briefly reviewed, as the most substantial amount of research on ethnic differences has been conducted in the area of intellectual assessment.

Assessment of Native Americans/Ethnic Differences in Performance on Psychometric Instruments

Assessing Intelligence in Native Americans

Other than the vast amount of research conducted on the prevalence rates of substance abuse, suicide, delinquency, physical abuse and neglect within Native American populations, the most substantial amount of research on ethnic differences including Native Americans has been conducted in the area of intelligence and aptitude testing. Although intelligence has not been examined as a factor influencing child reactions to natural disaster, the consensus of existing research will briefly be reviewed in order to illustrate racial differences that can be found on psychometric instruments.

The literature is rife with contradictions concerning the accuracy and adequacy of using standardized intelligence tests with various ethnic groups, including Native Americans. Nevertheless, there appears to be more similarity than difference in performance between ethnic groups on intelligence and achievement tests.

In assessing the cross-cultural construct validity of the WISC-R, Reschly (1978; as cited in Reynolds, 1983) found that the measure's factor structure is not congruent for whites and Native Americans if a three-factor solution (Verbal Comprehension, Perceptual Organization, and Freedom from Distractibility) is used to describe test performance. However, when the more standard g-factor and two-factor solutions (Verbal and Performance scales) are used to describe the WISC factor structure, Reschly found substantial congruence of factors across Native American Papagos, Whites, Blacks, and Mexican Americans. This indicates that this test is adequate for use with these ethnic groups.

However, in many Native American samples, including Navajos, Papagos, Cree and Ojibwa, Wechsler Verbal and Performance scale scores are discrepant, with scale score differences equivalent to 1 to 2 standard deviations (Dana, 1984; McCullough, Walker, & Diessner, 1985). This low correlation led authors to conclude that the Wechsler scales did not demonstrate adequate construct validity, and that the Full scale score was therefore an inaccurate representation of the "g" overall ability factor of intelligence (Dana, 1984; McCullough et al., 1985).

The Wechsler scales demonstrated low predictive validity for Native Americans on reading and math achievement, in contrast to the high predictive validity found for the measures' original standardization groups (McCullough et al., 1985). WISC-R scores overpredict achievement in reading and math (as measured by the Metropolitan Achievement Test). This test typically overpredicts performance for the disadvantaged, low SES ethnic minority groups, especially Native American groups as compared to other non-white groups (Reynolds, 1983). This overprediction could deny ethnic groups access to appropriate treatment services (Reynolds, 1983).

Although there are ethnic differences in the construct and predictive validities for the Wechsler scales, no consistent evidence of bias has been found for this or other popular intelligence tests

(Reynolds, 1983). According to some authors (Reynolds, 1983) this lack of consistent evidence indicates that this type of psychological test is perceived, reacted to, and functions in the same manner across races. Thus, differences found across race are true differences, and therefore test results can be interpreted similarly across groups. Others suggest that these tests be used tentatively (only as an aptitude test), realizing that the de-emphasis in native cultures on competition and "beating the clock" may result in a response style that produces IQ score differences that are more artifactual than actual (Beier, 1981; Dana, 1984; McCullough et al., 1985). Since response style affects performance on intelligence measures, response style will likely affect performance on other measures, such as self-report clinical scales.

Assessing Personality in Native Americans

The potential for bias in child personality measures has not received the extensive attention devoted to bias in intelligence tests, even though personality and behavior are more subject to the effects of culture than are intellectual abilities (Reynolds, Plake, & Harding, 1983). Because of the paucity of research, many psychologists are unsure how personality scale performance should be interpreted for those individuals who do not belong to the majority culture (Reynolds et al., 1983). Some psychologists assert that entirely different tests are needed to properly assess the personality of certain ethnic groups. Others believe that although it is permissible to use established tests, it is discriminatory to interpret tests and the behaviors they represent in an equivalent manner for differing groups (Reynolds, 1983). Some psychologists have used anecdotal or intuitive information to adjust test administration and interpretation. However, modifications of standardization or interpretation to describe performance by ethnic subgroups should not be made without adequate future substantive research (Reynolds et al., 1983).

As of yet, the majority of the literature does not validate the existence of cultural bias against native-born ethnic minorities in well-developed standardized intelligence tests. Evidence with personality and specific psychopathology instruments is less conclusive (Reynolds, 1983). Some popular standardized adult personality measures, such as the Minnesota Multiphasic Personality Inventory, the California Personality Inventory and the Rorschach, can be considered invalid and

insensitive when used with Native Americans, as they overpathologize this group (Dana, 1988; Pollack & Shore, 1980; Trimble, 1977). Authors also conclude that most child instruments cannot be interpreted properly for children from different socioeconomic and cultural backgrounds without further research (Argulewicz & Miller, 1984b; Dana, 1988). Existing research with psychological symptoms such as anxiety, behavior problems, and posttraumatic stress has generally not concentrated on the validity and prevalence of these problems within Native American child populations. The literature that does focus on the prevalence and presentation of these problems does not examine the adequacy of many popular child assessment materials for use with Native Americans.

The following section will further describe the research on the prevalence of anxiety, behavior problems, and posttraumatic stress in Native American populations. In conjunction with this description, the psychometric properties of child questionnaires used for the post-disaster assessment of anxiety, behavior problems, posttraumatic stress will be examined for both majority and minority groups. Finally, the literature on coping and acculturation, two traits which have been hypothesized to determine differences that are found between cultural groups, will be reviewed.

Assessing Anxiety in Native American Children

Presently, there is no systematic research examining assessment of anxiety in Native American children. Some research on prevalence has been conducted by using parental assessment of child presenting problems as the determination of "caseness," rather than verified diagnosis by a trained professional (Beiser & Attnave, 1882). Other declarations that Native Americans demonstrate a higher level of pathology are based solely on clinical impression (Indian Adolescent Mental Health, U.S. Congress, Office of Technology Assessment, 1990).

Some research on anxiety with Native American adults has shown that Native Americans have significantly higher levels of state anxiety than do white Americans, but are not higher in trait anxiety (as measured by the State-Trait Anxiety Inventory Scale (S-TAIS)(Pine, 1985). In this instance, the lack of difference in trait anxiety was considered to be the result of the similarity of other sample demographic variables such as SES, age, length of time lived in an urban setting, and living in the

same community. The author also concluded that in certain threatening situations, some Native Americans respond with greater levels of anxiety than Caucasians.

With children, the most widely used measure to assess anxiety is the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978; as cited in Reynolds, 1983). Although extensively validated, this measure has not been cross-validated for use with Native Americans. The RCMAS is often used in conjunction with other more specific anxiety measures to differentiate the type of anxiety found in children post-disaster. The standardization sample for the RCMAS consisted of 5000 children, ages 6-19 years, from White, Black, Mexican and Native American ethnic groups (Reynolds, Plake, & Harding, 1983). The number of Mexican and Native Americans included was so small that the groups were not examined separately nor were scores reported for these two groups. Although ethnicity accounted for approximately 1% of score variance, different percentile equivalents and scaled scores are reported at every age for four gender-by-race (White and Black) groups (Reynolds & Richmond, 1978, as cited in Reynolds et al., 1983). These authors do not recommend modification of test score interpretation based on ethnic background because of the small effect of ethnicity on total and subscale scores.

With a subset of the normative sample, Reynolds et al. (1983) found significant race-by sex-by-item interactions on the RCMAS, showing that approximately half of the items were biased in some form in the assessment of the subsample of 1200 Black, White, and Mexican American children. This bias has been considered insignificant for three reasons: one, the bias once again accounted for less than 1% of observed variance; two, the bias produced minimal variation in actual test scores; and three, the bias, both positive and negative, was balanced within and across the ethnic groups. Item bias had no consistent theme or similarity of content other than the items that were less reliable and more ambiguous were more biased. Because of the relative insignificance of the bias, the authors recommended against modification of test score interpretation in the assessment of ethnic children. These results are not necessarily accurate for Native American children. Although a small number of Native American children were included in

this sample, the number was so small that they were not analyzed separately from the group of Mexican American children.

In a sample of 444 children, grades 1-3, the RCMAS was found to be unbiased for use with Caucasian, Mexican American and Black students when cut-off scores are used to identify children at risk for chronic anxiety and to predict assignment to learning disabled and emotionally handicapped groups (Argulewicz & Miller, 1984a). For Whites, Blacks, males and females, the RCMAS has also been found to be invariant in some factor-analytic studies (Argulewicz & Miller, 1984b; Reynolds, 1983; Reynolds & Paget, 1981; Reynolds et al., 1983). Native American children were not utilized in these samples.

Cross-cultural application of the RCMAS has been researched with Nigerian children (Pela & Reynolds, 1982; Reynolds & Richmond, 1978). It was found that this sample's mean, standard deviation, and alpha reliability estimates were consistent with the test-development and other United States samples. While the instrument is psychometrically adequate for the Nigerian population, no significant sex differences were found, differing from the U.S. samples. This lack of sex difference may indicate cultural variation (Pela & Reynolds, 1982).

In summary, the RCMAS has been found to have good internal reliability, stability, construct validity, and concurrent validity across most ethnic groups (Argulewicz & Miller, 1984a, 1984b). Nonetheless, there are some instances in which the measure's usefulness is questionable or limited. The scale demonstrates more internal reliability for Whites than for Blacks or Hispanics (Argulewicz & Miller, 1984b). Reynolds and Paget (1981) concluded that the RCMAS should not be used for Black females under age 12, due to the extremely poor internal consistency reliability estimates for this group. Regardless of the decreased internal consistency when using this instrument with ethnic minority groups, the RCMAS has been extensively validated and is one of the best existing general anxiety measures for children. Its adequacy for use with the Native American child population is yet to be determined. Because of the cited ethnic differences on the RCMAS, it is likely that Native American children will respond differently from the normative sample. It is uncertain if this difference will be clinically significant.

Assessing Behavior Problems in Native American Children

There are many popular instruments used to assess behavior problems in children. Although these instruments have been extensively researched and validated, most do not provide norms for children of varying ethnic backgrounds. Of these instruments, the Eyberg Child Behavior Inventory (ECBI; Reynolds, 1983) provides the most specific information regarding ethnic differences. However, this information is limited only to Caucasian and African-American children.

The ECBI assesses the intensity and frequency with which various problem behaviors occur, and in disaster research, has been used to assess behavior problems and behavioral changes after potentially traumatic events. The ECBI has been extensively validated and has been widely reported in the child literature. In the early validation literature, the authors allotted little if any attention to the investigation or description of ethnic minority performance relative to that of the majority or standardization samples. Eyberg and Ross (1978) offered no description of the demographic distribution of their validation sample. Another standardization study, performed by Robinson, Eyberg, and Ross (1980), provided a relatively more detailed demographic description of a sample of 512 children that were primarily White and came from lower and lower-middle income families. The authors did not report actual ethnic breakdown, did not perform separate validation analyses or provide different normative data for the sample's ethnic groups (Robinson et al., 1980).

More recent studies with the ECBI utilizing larger samples have explored ethnic minority performance in relation to that of the majority culture. Burns and Patterson (1990), utilizing a Seattle sample of Caucasian, Black, and Asian school children (grades 1-12), found significant differences in frequency and intensity scores according to SES status, a variable that is often confounded with ethnicity. Analyses revealed a significant ethnicity effect on the Intensity and Problem scores, with black children receiving significantly higher scores on both scales than did Asian or White children. Although a significant ethnicity effect was found, ethnic status accounted for less than 3% of the variance in the scale scores. Because of this and the small number of minority children in their sample, the authors concluded that it was not yet clear what effect ethnicity has in the determination of child scores.

ECBI standardization samples have been more ethnically diverse than those of other child personality measures, and have even included a small number of Native Americans (Burns, Patterson, Nussbaum, & Parker, 1991; Burns & Patterson; 1991). However, the Native American children comprised only 4% of the sample, therefore, no analyses on the influence of ethnicity on scale means or factor structure were performed (Burns et al., 1991; Burns & Patterson; 1991). The effect of family income was examined and was found to have a significant effect on Intensity scores, with lower income groups scoring much higher (Burns et al., 1991). As mentioned above, income is often correlated with ethnic minority status. At this time, it is unclear how Native American normative rates for problem behaviors will compare to the previously established ECBI norms.

Assessing Posttraumatic Stress Disorder in Native American Children

There are only two standardized self-report measures designed to assess PTSD in children. One of these, the Children's PTSD Inventory (Saigh, 1989) has only been extensively used with war exposed Lebanese children. The other measure, the Reaction Index (RI; Frederick, Pynoos, & Nader, 1992) has been validated and used with American samples.

The RI is often used to assess the presence of the DSM-III-R posttraumatic diagnostic symptoms after a broad range of potentially disturbing events (Pynoos et al., 1987). While the RI has been researched and validated (Frederick, 1985; Pynoos et al., 1987) by correlating scores with confirmed clinical cases of PTSD (.91 for child cases, .95 with adults), there is not much literature describing its use with culturally diverse populations. The instrument was standardized on 1340 adults and 750 children who had experienced a broad range of traumatic events, from natural disasters to human induced trauma (Frederick, 1985). In the literature describing the development and standardization of the measure, there is no reference to any comparison of scores across ethnic minority groups. Factor analysis of the measure was performed without comparison of possible ethnic differences, even though the sample with which the analysis was performed would have been adequate for assessing racial differences (Pynoos et al., 1987).

In a study assessing life-threat and posttraumatic stress in school-age children after a sniper attack, Pynoos et al. (1987), found no significant differences by sex, ethnicity or age in a group of

159 children (50% Black, 50% Hispanic, ages 5-13 years) who had elevated RI scores. While it was reported that there was not a significant difference in performance across the two ethnic groups, this information is of limited relevance as score distributions and group norms were not reported separately for each group, nor were scores compared to those of Caucasians or of the normative group. In another study by Pynoos, Nader, Frederick, Gonda, and Stuber (1988), the authors used a larger sample (N=251) of the above sniper attack witnesses to examine grieving and Posttraumatic Stress Disorder. While many of the children had elevated scores, once again, the information is of limited usefulness in describing the experience of PTSD in ethnic minorities or how the disorder or RI scores were similar or discrepant across ethnicity or from the normative group. Frederick (1986) failed to report any ethnic breakdown at all in RI performance in a study assessing PTSD in sexually molested boys.

In summary, research with the RI has not adequately described performance across ethnic minority groups. The authors provide little to substantiate their claim of similarity in performance across Caucasian, Black, and Hispanic groups. While little information is provided on patterns of performance for these groups, even less is available to illuminate the usefulness of this measure with Native Americans. Not one published study exists which uses the RI to assess PTSD in any of the numerous Native American populations.

Assessment of Coping

In addition to posttraumatic stress symptoms, generalized anxiety, and behavior problems, coping is also assessed in response to a disaster. Increasingly, there has been more attention paid to the relationship between child and adolescent adjustment and stressful life events (Stark, Spirito, Williams, & Guevremont, 1989). Coping, one aspect affecting overall adjustment, may be an important mediator of the impact of life stressors on children's resulting short- and long-term adaptation (Knapp, Stark, Kurkjian, & Spirito, 1991). Recently, researchers have focused attention toward the type and efficiency of cognitive and behavioral coping strategies spontaneously used to mediate the stressor impact by individuals in these age groups (Stark et al., 1989). Because coping

can mediate the impact of stressful events, it is important to examine what constitutes successful coping in response to a natural disaster.

The Kidcope (Spirito, Stark, & Williams, 1988) is a well-validated instrument designed to assess child coping strategies in response to an identified stressor. In addition to assessing the type of coping strategies, this measure also assesses the child's perception of the efficacy of various coping strategies.

Using the Kidcope, Spirito, Stark, Grace, and Stamoulis (1991) assessed common problems and coping strategies in childhood and early adolescence. Subjects were 676 children, ages 9-13. Spirito et al. (1991) found that coping strategies employed differed by age and type of problem encountered. Overall, wishful thinking, problem solving, and emotional regulation were most frequently used, while resignation, blaming others, self-criticism, and social withdrawal were used the least of ten coping strategies assessed. All of the children in the sample were Caucasian; therefore no attempt was made by the authors to examine ethnic differences.

Stark et al. (1989) examined coping strategies used by a sample of 513 normal, predominantly White adolescents. The authors found that in response to commonly experienced problems, adolescent coping strategies varied as a function of gender and type of problem. Males used wishful thinking more than females, while females relied on social support more often than males. Males were also more likely than females to perceive resignation as an effective coping strategy. For both sexes, strategy use and efficacy did not differ by age. When evaluating the results from this study, one must recognize that the stressors in this study were relationship or school problems, and that racial differences were not examined.

At this time, there are no empirical data on Native American coping styles. However, it is probable that type and perceived efficacy of coping style affect a child's reaction to a natural disaster. Because of this, effective coping needs to be assessed. The following section will examine two variables that are hypothesized to affect the presentation of psychiatric disorders in Native American populations: coping and acculturation. There are few studies on Native American

acculturation or coping style, therefore clinical impression and anecdotal information on these topics will be discussed.

Factors Affecting Presentation and Prevalence of Psychiatric Disorders

Coping

Personality traits described in literature provided the Indian Adolescent Mental Health (1990) include passive resistance to adults, withdrawal in the face of threat, and peer orientation with a subsequent lack of attending to adults. Little research has attended to the positive mental health attributes, such as coping abilities, that could prove to be important predictors of recovery from disorder and that have been more extensively studied in the White population (Beiser, 1981). Native Americans have been contrasted with Caucasians on a number of value orientations, such as harmony with nature instead of subjugation of nature, present time and following the old ways, instead of future orientation and focus on progress and change, cooperation over competition, anonymity and humility over recognition, drawing attention to self, and keeping to oneself over verbal expression (Everett, Proctor, & Cartmell; 1983; Heinrich, Corbine, & Thomas; 1990). These values cause Native Americans to be perceived as very passive in coping style and therefore as possessing ineffective coping abilities. However, the type and subjective effectiveness of coping strategies used by Native American children, and the resulting effect on adjustment after a life stressor have not been adequately tested.

Acculturation

Ethnicity and level of acculturation to the majority culture have been cited to affect the expression and prevalence of psychiatric disturbances (Burnam, Hough, Karno, Escobar, & Telles, 1987). It is therefore likely that acculturation could demonstrate some effect on the presentation of anxiety, behavior problems, and PTSD in minority individuals in both disaster and non-disaster samples.

Enculturation refers to the process by which individuals learn from their home culture (Little Soldier, 1985). Many Native American children come from homes that may be considered culturally diverse, as they do not reflect the characteristics of the general American culture (Little

Soldier, 1985). Culturally diverse persons are often required to acquire the behaviors and values of the culturally dominant group in order to gain access to and function within the majority group. This process is termed acculturation (Little Soldier, 1985).

Acculturation refers to changes in the original patterns of cultural groups that have continuous, first-hand contact with one another (Dana, 1986). The dominant culture exerts pressure on those in the deviant culture to adopt its characteristics, and hence become acculturated (Heinrich, Corbine, & Thomas, 1990). Dimensions which determine level of acculturation of Native Americans can include: social behavior, social membership, and activities; value orientation and cultural attitudes, including identity and attitude toward one's traditional culture; blood quantum (degree of Indian blood); language preference and usage; and educational and occupational status (Dana, 1986).

The acculturation of Native Americans ranges on a continuum from traditionally oriented or identification with the Indian world, to fully assimilated to the non-Indian world, with acculturation or biculturalism placed within the center of this continuum (Little Soldier, 1985). Bicultural individuals are enculturated in traditional Indian ways but have acquired behaviors and values necessary for functioning in the dominant-majority culture (Little Soldier, 1985). The use of acculturation to describe Native American groups is complicated further by the fact that there is no one single description of the typical American Indian. All Native Americans vary according to tribal affiliation to one or more of 530 tribes, degree of blood, and level of acculturation (Everett, Proctor, and Cartmell, 1983).

In spite of the diversity found across Native American groups, there are similarities in values that exist across tribes and regions (Heinrich et al., 1990). Traditional Native American enculturation includes the values of: extended family orientation; cooperation; not demonstrating curiosity or asking questions while learning through observation and patience; noninterference; anonymity; humility; keeping to oneself; harmony with nature; and a time perspective oriented toward the present and not the future (Everett et al., 1983; Heinrich et al., 1990; Little Soldier, 1985). These contrast with typical contemporary Anglo-American values of: reliance on experts

rather than extended family; competition; fame; recognition; verbal expression; subjugation of nature; and a time perspective oriented to the future, progress, and change (Heinrich et al., 1990).

More than just a descriptor, acculturation is a moderator variable that affects the nature of psychiatric symptoms and presenting complaints (Dana, 1992). It also affects performance on assessment instruments whenever the tests are used on individuals who are culturally different from the population for which the instrument has been developed and used (Dana, 1986; Dana, 1992). The data and/or interpretation of existing instruments may be modified or qualified by the extent of acculturation. However, this is difficult at present because measurement of acculturation is not refined. Measures do exist for reservation residents, but measures designed for use with urban residents from all or mixed tribes are still preliminary, as few are adequate psychometrically (Dana, 1992). Presently, applications of independent acculturation scales to self-report instruments have been very rare (Dana, 1986).

Current Investigation

Posttraumatic stress symptoms, general anxiety, behavior problems, and coping have been found to be important variables for examination in disaster research. However, these domains have not been consistently examined with well-standardized and accepted measures. This study utilized standardized measures to collect local normative data for posttraumatic stress symptoms, general anxiety, behavior problems, and coping in children residing in Oklahoma, an area with frequent tornadic activity.

This study had two primary purposes. First, this study examined the possibility that residents of Oklahoma have levels of posttraumatic stress, general anxiety, and problem behaviors that differ from the reported national norms for these domains. It was hypothesized that children in this sample would have elevated levels of posttraumatic symptoms as assessed by the Reaction Index, but not demonstrate elevations in generalized anxiety or problem behaviors, thereby demonstrating sensitization (as defined by elevations of posttraumatic symptoms) to tornados. The data collected have implications for previous and future disaster research conducted in disaster-prone areas in which chance for revictimization and/or re-exposure are high. Prior to performing analyses relevant

to the first purpose of the study, analyses relevant to the second purpose of the study were performed to determine if Caucasian and Native American subjects could be combined to form one Oklahoma sample that could be compared to the national norms, or if the two groups should separately be compared to the national norms.

The second purpose was to explore differences between Caucasian and Native American children on these measures. Because of the high number of Native Americans that reside in this disaster-prone area, the study was designed to accommodate and make a comparative analysis of ethnic differences between Caucasians and Native Americans. This study compared levels of posttraumatic stress, general anxiety, problem behaviors, and coping strategy use in demographically similar samples of Caucasian and Native American children. These analyses were exploratory; the hypothesis for the effects of ethnicity was non-directional. Results of these analyses have implications for the appropriateness of use of the posttraumatic stress, general anxiety, and problem behaviors questionnaires in the assessment of Native American children in both disaster and other clinical samples. Native American children were not represented in these normative standardization samples, and the applicability of these norms to these children had not yet been examined. Extensive demographic and acculturation data were also assessed in order to allow for adequate description of the Native American sample. Ethnic differences were explored within the context of coping and acculturation.

Method

Recruitment

Census data were reviewed to determine which Oklahoma elementary school districts had the greatest number of Native American children. Two districts were chosen on basis of Native American population and location. The school districts of interest, Chelsea and Tahlequah, were contacted to determine willingness to participate. Information on established procedures for permitting outside research was obtained from the interested schools. Children in grades 3-6 were targeted as participants as this range is consistent with that in previous Oklahoma tornado

research, and due to the fact that there is low reliability on self-report measures with children under the age of eight.

Procedure

Packets containing assessment materials and research protocols were provided to these school districts for review. Upon approval from the school districts, packets containing an explanation of the study, consent forms, and the demographic, problem behavior, and acculturation questionnaires were distributed to the children at the end of the school day to be taken home to parents. Parents were notified that families would receive compensation for their participation at the rate of \$5 per completed parent packet and \$5 per completed child packet, with compensation to be made after data collection. Completed parent packets and parental consent forms were returned to the schools. After collection of completed parent packets, children with written parental consent were invited to participate in the study the day of data collection at the schools. Those who agreed to participate completed their questionnaires at school with the assistance of the experimenter and her colleagues. The experimenter, accompanied by several colleagues, read the questionnaires aloud to groups of children grouped by grade to ensure comprehension. The children followed along with their questionnaires and marked their choices. The experimenter and colleagues answered any questions the children had. Administration time for the questionnaires was approximately 25-30 minutes per group. Checks were mailed to participating families two weeks after data collection.

Participants

Participants in this study were children in grades 3-6 and their parents. Participants were solicited from five schools in the two school districts that were chosen on the basis of Native American population and location. These districts, Chelsea and Tahlequah, have a large population of Native American children and are located in Oklahoma, which has frequent tornadic activity.

Of nearly 1085 subjects solicited, 373 families agreed to participate, resulting in a return rate of 34%, which is consistent with the 30-40% rate reported in much of the disaster research (e.g.,

McFarlane, 1987), but somewhat higher than return rates for previous Oklahoma disaster research, which were generally slightly lower than 30% (Romero, 1991; Hutchison, Sullivan, & Romero, 1993). Return rates were lower for the Tahlequah district (26.26%) than for the Chelsea district (34.74%).

Participants were screened after data collection to ensure that children who have had recent direct experience with a tornado were excluded from the group analyses. Families ($n=20$) that reported direct exposure to a tornado within the past two years or who reported an unusually high degree of previous tornado exposure (e.g., a child having had direct exposure to more than five tornados) were excluded from statistical analyses. Fifty-three participants with incomplete data (missing all parent or all child data) were also excluded from further analyses, resulting in a final sample size of 303 participants.

Of the remaining subjects, 129 of the 153 Caucasians reported having no previous direct tornado exposure. For the Native Americans, 128 out of 150 reported having no previous direct tornado exposure. Of the 46 parents who reported their children had previous direct exposure, 36 reported the child had experienced one tornado, 8 reported the child had experienced 2 tornados, and 2 reported the child had experienced 3 tornados. The level of exposure for these families was low. The majority of these families (70%) experienced no damage to their homes, and 91% were able to stay in their homes after exposure. During the tornado, 26% of the children were not scared at all, 39% were somewhat scared, 28% were very scared, and 6% were terrified. Since the tornado, 15% have not been scared at all, 56% have been somewhat scared, 26% have been very scared, and 2% have been terrified.

Nearly all parent forms returned were completed by mothers (87.50%). ANOVAs were conducted on continuous variables and Chi-squares were conducted on categorical variables to explore the possibility of group differences in demographic variables. Only one difference, in level of education of the non-responding parent, was found (see Table 1). An ANOVA revealed that the Caucasian non-responding parents' education level was significantly higher than that of the Native American non-responding parents ($F(1,220) = 4.22, p = .04$). Additional demographic information

for the sample is also presented in Table I. The average age of the children was 10 years 10 months ($SD = 1.22$ years; range = 7 years, 4 months to 15 years, 0 months). The sample consisted of 146 boys and 157 girls.

The reporting parents represented a range of educational levels, as assessed by the demographics questionnaire. The questionnaire assigned a level (1-17) based on years of formal education a person has completed, with 1-8 indicating years of grade school, 9-12 indicating years of high school, 13-16 indicating years of college, and 17 and over indicating graduate school. The mean educational level was 13.43 ($SD = 2.44$), which is equivalent to a high school diploma and approximately one year of college coursework. Twelve percent had post-graduate degrees, 15 percent were college graduates, 29 percent were high school graduates who had taken at least some college courses, 27 percent were high school graduates, and 14 percent had not achieved high school diplomas.

Of the subjects, 153 children were Caucasian and 150 children were Native American. Native American parents and parents of Native American children were asked to report tribal affiliations and to complete the Native American Acculturation Questionnaire. A large number of diverse tribal affiliations were reported (see Table 2). However, most families reported Cherokee as their tribal affiliation. A large number reported affiliation with more than one tribe. On a scale of 1 to 4, the Native American families were moderately to highly acculturated along spiritual/religious (mean = 3.23, $SD = .80$), social/recreational (mean = 3.16, $SD = .68$), training/educational (mean = 3.08, $SD = 1.04$), and family/social domains (mean = 3.12, $SD = .86$), and in overall level of acculturation (mean = 3.16, $SD = .58$)(see Table 3). The Native American sample in this study was a highly acculturated, primarily Cherokee sample.

Measures

Parent Forms

Demographics Questionnaire. This measure assesses basic demographic information in order to determine socioeconomic status for the children and their families. This measure also assesses ethnicity, Native American tribal affiliations, and child experiences with tornados. (See Appendix A).

Native American Acculturation Measure. (R. H. Dana, personal communication, 1993). This is a self-report measure adapted from a clinical interview designed by Brown (1982). This measure assesses tribal affiliation and the degree to which Native Americans adhere to a traditional Native or mainstream American value system. This measure assesses four domains: spiritual/religious; social/recreational; training/education; and family/self. There are no reports of reliability or validity for this measure. (See Appendix B).

Eyberg Child Behavior Inventory (ECBI; Eyberg & Ross, 1978; Reynolds, 1983). The ECBI is a 36-item parental report measure of child behavior problems which are rated on both a problem intensity scale and a problem frequency scale. The measure yields a total problem score, to describe the disruption caused by the behavior, and a total frequency score, to describe the rate of the behavior's occurrence. Inter-rater reliability, internal consistency, and discriminant and concurrent validity have been established (Burns & Patterson, 1990; Burns, Patterson, Nussbaum, & Parker, 1991; Boggs, Eyberg, Reynolds, 1990; Eyberg & Robinson, 1983; Eyberg & Ross, 1978). (See Appendix C).

Child Forms

Frederick Reaction Index, Form C. (RI; Frederick, 1985; copyright by Frederick, Pynoos & Nader, 1992). The RI used in this study is a 20-item child self-report scale of acceptable internal consistency reliability (Lonigan, Shannon, Finch, Daugherty, & Taylor, 1991), and concurrent and discriminant validity, demonstrating consistency with clinicians' diagnoses of PTSD (Pynoos et al 1987). The five-point scale is designed to assess symptoms after exposure to trauma. Items assess the frequency of symptoms such as bad dreams, somatic symptoms, recurrent recollections of the event, and the associated depression and anxiety related to PTSD or traumatic experiences. The RI also provides a severity index which is used to indicate level of symptomatology and whether the criteria for diagnosis of PTSD are met. (See Appendix D).

Revised Children's Manifest Anxiety Scale. (RCMAS; Reynolds & Richmond, 1985). The RCMAS is a true/false child self-report measure of trait anxiety which provides a total anxiety T score, a social desirability score, and three factor or scaled scores (Worry/Oversensitivity, Social

Concerns, Physiological Anxiety). The 37-item scale has been found to have good internal consistency, test-retest reliability, and construct validity (Reynolds & Richmond, 1985). (See Appendix E).

Kidcope. (Spirito, Stark, & Williams, 1988). The Kidcope is a 15-item checklist that measures the frequency of use of 10 cognitive and behavioral coping strategies and the relative effectiveness of each. The version for children aged 7-12 years was used to assess coping in response to an imagined tornado. This process measure of coping is of adequate reliability and demonstrates moderate to high concurrent validity with other coping measures (Spirito, Stark, & Williams, 1988).

Results

Data were analyzed using the Statistical Package for the Social Sciences Graduate Pack™ Advanced Version - Windows V6.1.3. A probability level of less than .05 was used for significance for all statistical tests. Prior to conducting analyses relevant to examining a possible sensitization effect, Caucasian and Native American subjects were compared on all demographic and dependent variables to examine any possible group differences. If significant group differences were found to exist, the groups would separately be compared to national norms for posttraumatic stress symptoms, behavior problems, and general anxiety. If no significant differences were found, the two ethnic groups would be combined to form one Oklahoma sample that would be compared to national norms.

Demographics

As mentioned above, only one difference in demographic variables was found (see Table 1). Level of education of the non-responding parent was higher for Caucasians than for Native Americans ($F(1,220) = 4.22, p < .04$). This variable, level of education of the non-responding parent, is a factor of socioeconomic level, as determined by the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975), which was calculated from demographic information to evaluate socioeconomic status of participants in this study. Socioeconomic level, or the SES Index, is calculated from education, occupation, sex, and marital status. An ANOVA did not reveal any group difference on the SES Index (Hollingshead, 1975). The SES Index for the entire sample was

37.54 ($SD = 13.64$), which is the midpoint of the defined social strata (skilled craftsmen, clerical, sales workers) which ranges from unskilled laborers and menial services workers, to higher executives, proprietors of large businesses, and major professionals (Hollingshead, 1975). For Caucasians, it was 38.71 ($SD = 13.97$), and for Native Americans, it was 36.34 ($SD = 13.21$), which are both also in the midpoint of social categories.

Although there was no difference in the SES Index between groups, due to the widely acknowledged relationship between socioeconomic level and psychopathology (Burns et al., 1991; Taylor, 1986; Trites, 1979; McGee, Williams, & Silva, 1984), the SES Index was correlated with all of the dependent variable total scores (ECBI Frequency and Problem scores, RI total score, RCMAS total score) to examine the possibility of such relationships in this sample. Pearson correlations revealed that SES Index was significantly correlated with the ECBI Frequency score ($r = -.11, p < .05$) and the ECBI Problem score ($r = -.20, p < .05$). Two RCMAS total scores, a raw total score, and a calculated total T score, were individually correlated with the SES Index. Both scores were used in the analyses, as Native Americans were not included in the measure's norm sample, and therefore the accuracy of T conversions for this group on this measure were questionable. SES Index was significantly correlated with the RCMAS raw total score ($r = -.1315, p < .05$) and the RCMAS calculated total T score ($r = -.16, p < .05$) in tests of two-tailed significance. Due to the significant correlation of socioeconomic level with many of the dependent variables, it was decided that SES would be used as a covariate when group differences in posttraumatic stress symptoms, general anxiety, and problem behaviors were examined.

Eyberg Child Behavior Inventory (ECBI)

Two total scores were calculated from this parent-report measure: a Frequency score reflecting the frequency of occurrence of problem behaviors and a Problem score reflecting how many behaviors parents found problematic. For Caucasian children, the mean Frequency score was 87.48 ($SD = 29.79$, range = 36-156) and the mean Problem score was 6.29 ($SD = 7.27$, range = 0-29). Sixteen Caucasian children, or 10.46% of these children, scored above the ECBI clinical cutoff (Frequency score ≥ 127 and Problem score ≥ 11). For Native American children, the

mean Frequency score was 91.53 ($SD = 33.58$, range = 36-212) and the mean Problem score was 6.57 ($SD = 7.52$, range 0-27). Nineteen, or 12.67% of Native American children scored above the clinical cutoff. A simple ANCOVA (See Table 4) indicated that there was no significant difference between the mean Frequency score for the two ethnic groups ($F(1, 288) = .40$, $p > .05$). Similarly, no difference in mean Problem score was found ($F(1,288) = .14$, $p > .05$) (See Table 4).

Chi-square analyses (ethnic group X clinical classification) revealed that the proportion of participants below the clinical cutoff and above the clinical cutoff were similar for both the Native American and Caucasian groups ($\chi^2 = .36$, $df = 1$, $p > .05$).

Reaction Index (RI)

For Caucasian children, the average RI total score was 30.19 ($SD = 11.36$), with scores ranging from 6 to 62 on this measure, which has a range of possible scores from 0 to 100 (See Table 5). According to their self-reports, 2 children (1.3%) experienced no symptoms of PTSD, 49 (32%) experienced a mild level of PTSD symptoms, 68(44.4%) experienced moderate PTSD symptoms, 33 (21.6%) experienced severe symptoms, and 1(.7%) experienced a very severe level of symptoms. Thus, 66.7% of Caucasian children rated themselves as displaying elevated levels of PTSD symptoms, with 22.2% in the severe or greater range.

For Native American children, the average RI total score was 29.44 ($SD = 11.39$), with scores ranging from 6 to 59. According to their self-reports, 6 children (4%) experienced no symptoms of PTSD, 44 (29.5%) experienced mild PTSD symptoms, 65 (43.6%) experienced moderate PTSD symptoms, and 34 (22.8%) experienced severe symptoms. Thus, 66.4% of Native American children rated themselves as displaying elevated levels of PTSD symptoms, with 22.8% in the severe range.

A Chi-square analysis was conducted to examine group differences in the degree of severity of PTSD symptoms (none, mild, moderate, severe, very severe). No differences were found ($\chi^2 = 3.30$, $df = 4$, $p > .05$). A chi-square analysis was also conducted to examine group differences in number of participants with a severe or greater level of symptoms. This was also non-significant ($\chi^2 = .02$, $df = 1$, $p > .05$).

Revised Children's Manifest Anxiety Scale (RCMAS)

The mean RCMAS calculated total T score for Caucasian children was 50.35 (SD = 10.71), with 6 (3.92%) children above the clinical range (T score \geq 70). The RCMAS subscores were similarly moderate. The Physiological Anxiety scaled score mean was 9.53 (SD = 3.27), with 4 children (2.61%) above clinical level (scaled score $>$ 13). The Worry/Oversensitivity scaled score mean was 9.87 (SD = 2.82), with 5 (3.27%) children above clinical level. The Social Concerns/Concentration scaled score mean was 9.26 (SD = 3.04), with 3 (1.96%) children above clinical level. The mean and number of children above clinical level was slightly higher for the Lie scaled score (M = 10.47, SD = 2.86, with 6 children or 3.92% above clinical.)

The mean RCMAS total T score for Native American children was 50.59 (SD = 10.55), with 4 (2.67%) above the clinical range (T score \geq 70). The RCMAS subscores were also moderate, with the means consistent with the Caucasians' scores. The Physiological Anxiety scaled score mean was 9.70 (SD = 3.08), with 4 children (2.67%) scoring above clinical level. The Worry/Oversensitivity scaled score (M = 9.95, SD = 2.94) had fewer children (2 or 1.33%) above clinical level. Similarly, two children (1.33%) were above clinical on the Social Concerns/Concentration scaled score (M = 9.50, SD = 2.73). Three (2.00%) children scored above clinical level on the Lie scaled score (M = 10.41, SD = 2.91).

Anxiety Multivariate Analysis of Covariance

In order to examine differences between the two ethnic groups' anxiety symptoms, a MANCOVA was conducted to compare the two groups on the RI Total Score, the RCMAS raw total score, the RCMAS total T score, and the four RCMAS factor scores, while holding socioeconomic level constant (see Table 6). SES predicted both RCMAS total scores and the Physiological Anxiety scaled score, but results of race were nonsignificant. Chi-square analyses were also performed on the RCMAS total T score and four scaled scores to examine differences in the proportion of participants exhibiting clinical level of symptoms between the two groups. Clinical level was defined as a T score greater than or equal to 70 for the total score, and a score greater than or equal to 16 for the scaled scores. No differences were found.

Kidcope

Group mean frequency scores were computed for each of the 10 strategies on this scale in order to determine which coping strategies children reported they would use if a tornado were to occur in their town. Additionally, group mean efficacy scores were computed for each of the strategies in order to determine how effective the children believed the strategies would be if they were to use them. These data are presented in Table 7. Chi-square analyses revealed that there were no group differences in the number of children who reported having experienced a tornado. ANOVAs did not reveal any differences in how the children believed they would react (degree of nervousness, sadness, or anger) if a tornado were to occur and damage their town. Chi-square analyses demonstrated only one significant difference in coping strategy use. More Native American than Caucasian children reported they would use distraction as a coping mechanism ($\chi^2 = 3.79$, $df = 1$, $p < .05$). However, after Bonferroni correction for familywise error was made, this difference was no longer significant ($p > .0125$). ANOVAs were conducted to examine differences between groups in strategy efficacy; no differences were found. Visual inspection of the means indicated that children believed they would use wishful thinking, emotional regulation, and social support most often. Social support, wishful thinking, and emotional regulation were given the highest effectiveness ratings of the ten strategies measured.

National Versus Local Norms

As no significant differences were found between the Caucasian and Native American subjects, the two groups were combined for the comparison of the local sample to national norms. The percentage of Oklahoma children at or above clinical cut-off levels for problem behaviors (as measured by the ECBI) and general anxiety (as measured by the RCMAS) was compared to the percentage of children at or above clinical level in the measures' normative samples (Burns & Patterson, 1990; Reynolds & Richmond, 1985). Chi-square goodness of fit tests were conducted to compare the clinical distributions of the Oklahoma and national norm samples. In the Oklahoma sample, 11.5% of the children scored above the clinical cutoff level for the ECBI (Frequency score ≥ 127 and Problem score ≥ 11); 88.4% scored below the clinical level. For the norm sample, 7.9%

scored above clinical, with 92.1% below (Burns & Patterson, 1991). A chi-square analysis revealed that the properties of the sample differed significantly from the properties expected from the national sample ($\chi^2 = 5.42$, $df = 1$, $p < .05$).

For the RCMAS total T score, 3.3% of the Oklahoma children were above the clinical level, with 96.7% below. For the norm sample, 2.5% were above clinical, with 97.5% below (Reynolds & Richmond, 1985). The chi-square analysis comparing these two distributions was not significant ($\chi^2 = .80$, $df = 1$, $p > .05$). To test the sensitization hypothesis, the national and Oklahoma samples were compared on the RCMAS Physiological Anxiety subscore as well. The chi-square was not significant ($\chi^2 = .01$, $df = 1$, $p > .05$).

Chi-square analyses comparing the number of children above clinical level on the RI in the Oklahoma sample to that in the norm sample on the RI were not conducted. The RI has not yet been standardized on a non-disaster sample. As the only information currently available on this measure is from disaster samples, no comparison of this non-disaster sample to a normal sample could be made. As mentioned above, the Physiological Anxiety scaled score could be considered a crude measure of PTSD symptomatology, and was therefore used to examine possible sensitization. Although this score was not elevated in the Oklahoma sample, the sample did report higher levels of PTSD on the RI than would be expected in a normal sample, as 66% rated themselves as having a moderate or higher level of symptoms, with 22% reporting a severe level of symptoms. Pynoos et al. (1987) reported that after exposure to a fatal sniper attack, 38.4% of the children in their sample had either moderate or severe PTSD symptoms, with 22% reporting a mild level and 39% reporting no PTSD. Frederick (1987, as cited in Frederick, 1994) reports that in a sample of 100 disaster victims, 11% did not have PTSD, 19% had a mild level, 42% had a moderate level, 21% had a severe level, and 7% had a very severe level of PTSD. The distribution of Oklahoma subjects across PTSD severity levels is similar to that found in disaster samples.

Native Americans: Relationships Between Acculturation, Symptom Levels, and Coping

The Native American sample in this study was highly acculturated (see Table 3). No differences between Native Americans and Caucasians were found in levels of PTSD symptoms,

anxiety, or problem behaviors. It is possible that this failure to find differences was due to the subjects' high acculturation level, which may have moderated any potential differences between the two groups. Therefore, further analyses were conducted to explore how acculturation may influence levels of symptoms and frequency of use and reported efficacy of coping strategies. All Native American Acculturation variables (Spiritual/Religious, Social/Recreation, Training/Education, and Family/Self, Native American Total Acculturation Score) were correlated with the dependent variable total scores (ECBI frequency and efficacy scores, RI total score, RCMAS raw total score, RCMAS total calculated T score, RCMAS scaled scores, Kidcope frequency and efficacy scores) to explore possible relationships between acculturation and psychological symptoms and coping as measured in the study. Several significant correlations were found prior to Bonferroni corrections. Spiritual/Religious scores were correlated with helpfulness of utilizing distraction as a coping technique ($r = -.1689$, $p < .05$) and with the helpfulness of using wishful thinking ($r = -.1787$, $p < .05$). Social/Recreation scores were correlated with the RCMAS raw total ($r = -.1782$, $p < .05$), the RCMAS total T score ($r = -.1740$, $p < .05$), and the RCMAS Physiological Anxiety scaled score ($r = -.1581$, $p < .05$). It was also correlated with use of social withdrawal ($r = -.1858$, $p < .05$) and effectiveness of blaming others as a coping strategy ($r = -.4899$, $p < .05$). Training/Education scores were correlated with the helpfulness of two different coping strategies: social support ($r = .2297$, $p < .05$) and blaming others ($r = -.4824$, $p < .05$). Family/Self scores were correlated with use of social withdrawal as a coping mechanism ($r = -.1578$, $p < .05$). Two significant correlations were found between the Native American Total Acculturation Score and coping: one between the Total Acculturation score and the efficacy of utilizing social support ($r = .1824$, $p < .05$), and one between the Total Acculturation score and the efficacy of blaming others ($r = -.5016$, $p < .05$). However, after Bonferroni corrections were made to adjust for the large number of tests run to detect differences in coping strategy efficacies, these correlations were no longer significant. Overall, no significant correlations between acculturation, PTSD, general anxiety, problem behaviors, or use or efficacy of coping strategies were found.

Regression Analysis: Coping Strategy Use and Prediction of Posttraumatic Stress Symptoms

For the entire Oklahoma sample, a stepwise multiple regression analysis was used to examine relationships between use of coping strategies and PTSD symptomatology, as measured by the RI total score, to determine if use or lack of use of certain strategies was related to the degree of reported symptoms. Use of problem solving, wishful thinking, social support, cognitive restructuring, self-criticism, and emotional regulation had significant, positive zero-order correlations with the RI total score. Problem solving, wishful thinking, and self-criticism were each found to have significant unique contributions in predicting level of PTSD symptoms. The proportion of variance explained by the variables increased from .06 (problem solving, entered in step 1), to .09, with the addition of wishful thinking in step 2, to .11 with the addition of self-criticism in step 3. Distraction, emotional regulation, social withdrawal, cognitive restructuring, social support, resignation, and blaming other were not entered into the equations (see Table 10).

Internal Consistency Reliability Estimates of the ECBI, RCMAS, and RI for Caucasian, Native American, and Combined Samples

Given the similarity of scores and lack of differences across measures, the internal consistency of the posttraumatic stress, general anxiety, and behavior problems measures was examined for each group and for the combined Oklahoma sample. For the Caucasian sample, the coefficients alpha for the ECBI Intensity Score, ECBI Problem Score, RCMAS, and RI were .94, .93, .83, and .74, respectively. For the RCMAS factor scores, reliability coefficients for the Caucasian sample were .74 (Physiological Anxiety), .78 (Worry/Oversensitivity), .77 (Social Concerns/Concentration), and .75 (Lie). For the Native American sample, the reliability coefficients for the ECBI Intensity Score, ECBI Problem Score, RCMAS, and RI were .95, .93, .84, and .76. For the RCMAS factor scores, reliability coefficients for the Native American sample were .70 (Physiological Anxiety), .80 (Worry/Oversensitivity), .70 (Social Concerns/Concentration), and .76 (Lie). For the combined sample (N = 303), the reliability coefficients were .95 for the ECBI, .83 for the RCMAS, and .75 for the RI. For the RCMAS factor scores, the combined reliability coefficients were .72 (Physiological Anxiety), .77 (Worry/Oversensitivity), .74 (Social Concerns/Concentration),

and .75 (Lie). Reported reliability estimates for these measures are a coefficient alpha of .93 for the ECBI Intensity Score and .91 for the ECBI Problem Score (Burns & Patterson, 1990), .85 for the RCMAS total anxiety score (Reynolds & Richmond, 1985), and .83 for the RI (Lonigan, Shannon, Finch, Daugherty, & Taylor, 1991). The reliability of the RCMAS factor scores is reported to be lower, with Physiological Anxiety alpha reliability estimates consistently in the .60s and .70s, Worry/Oversensitivity estimates in the .70s and .80s, Social Concerns/Concentration estimates in the .60s, and Lie estimates in the .70s and .80s (Reynolds & Richmond, 1985).

Discussion

The present study utilized well-standardized and accepted measures to collect local normative data for posttraumatic stress symptoms, general anxiety, behavior problems, and coping in children residing in Oklahoma, an area with frequent tornadic activity. The study had two primary purposes. The first was to examine the possibility that residents of Oklahoma might have elevated levels of posttraumatic stress symptoms as assessed by the Reaction Index, while displaying levels of general anxiety and behavior problems consistent with normative levels reported for the national standardization samples for questionnaires assessing these domains. This elevation of posttraumatic symptoms would be taken as an indication of a sensitization to tornados.

The second purpose of the study was to explore and make a comparative analysis of differences between Caucasian and Native American children on the measures used to assess posttraumatic symptoms, general anxiety, behavior problems, and coping. Oklahoma has a large population of Native Americans, and this group may comprise a substantial proportion of subjects in disaster research conducted in the state. This is problematic due to the fact that this group has not been included in the standardization samples for measures commonly used to assess post-disaster adjustment. Therefore, interpretations of Native American self-report questionnaire responses, and interpretations of differences between the responses of Native Americans and other groups, has been difficult. Thorough comparison of the responses of Native Americans and Caucasians to the self-report questionnaires used in this study also provided much needed

information regarding the appropriateness of use of the questionnaires' norms, which are based on Caucasians, or Caucasians, African Americans, and Hispanics, with this ethnic group.

Prior to examining differences between the questionnaire responses of Oklahoma children and the reported national standardization norms for posttraumatic stress, general anxiety, and behavior problems, Caucasian and Native American children were compared on all measures to determine if the two groups could be combined for comparison to the national norms or would need to be compared separately. The two samples, Caucasians and predominantly Cherokee, highly acculturated Native Americans, were first compared on all demographic variables assessed. Only one demographic difference between the two groups was found. This difference was in the education level of the nonresponding parent (or father's education level). The education level of both parents is a factor contributing to the family's socioeconomic level, as measured by the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975). Despite this difference, the higher order variable of socioeconomic level was not different for the two groups.

Due to the well-accepted correlation of socioeconomic level with reports of psychological symptoms (Burns et al., 1991; Taylor, 1986; Trites, 1979; Mc Gee et al., 1984), the correlation of socioeconomic level with level of symptoms reported for PTSD, general anxiety, and behavior problems was assessed. Socioeconomic level was found to be significantly correlated with levels of general anxiety and with the frequency and intensity of behavior problems; therefore, socioeconomic level was used as a covariate for the multivariate analysis of variance conducted for group differences in posttraumatic stress and general anxiety, and for the analysis of covariance to detect group differences in behavior problems.

The analyses conducted did not demonstrate any significant differences between the predominantly Cherokee, highly acculturated Native American children and the Caucasian children in the mean levels of frequency or intensity of behavior problems, nor in the proportion of subjects below the clinical cutoff and above the clinical cutoff suggested for that measure (Eyberg & Ross, 1978). Socioeconomic level was found to explain a significant amount of the variance in the scores for both frequency and intensity of behavior problems. However, after this variance was accounted

for, the two ethnic groups did not differ in intensity or frequency of behavior problems. This finding is consistent with other research that has shown that socioeconomic status contributes to measured levels of behavior problems (Burns et al., 1991; Taylor, 1986; Trites, 1979; Mc Gee et al., 1984). Again, the results of analyses on the behavior problem scores indicate that highly acculturated Native Americans do not score differently from Caucasians on this measure, in terms of mean levels of intensity or frequency of behavior problems, nor does the distribution of scores below and above clinical level differ between the two groups. The Native Americans in this sample responded to the ECBI in a manner consistent with the norm group, and presented with the same level of symptoms as measured by this questionnaire. These results indicate that the reported norms for this measure and the suggested clinical cutoff score are both appropriate for use with this group.

The analyses conducted to examine group differences in anxiety also failed to detect any difference between the two groups in mean levels of posttraumatic stress symptoms, general anxiety, or in the factor scores (Physiological Anxiety, Worry/Oversensitivity, Social Concerns/Concentration, or Lie) included on the measure to assess general anxiety. Socioeconomic level, used as a covariate in these analyses, was found to explain a significant amount of variance in the general anxiety total raw score, the general anxiety total T score, and the physiological anxiety subscore, but not the posttraumatic stress symptom score. After this variation was accounted for, there were no differences between the two groups. These results partially support the relationship between socioeconomic status and level of symptoms, but do not support the existence of any differences in reports of posttraumatic stress or generalized anxiety symptoms in these groups. Analyses also failed to detect any differences in the distribution of PTSD and general anxiety scores across the two groups. There were no group differences in the degree of severity of PTSD symptoms (none, mild, moderate, severe, very severe), nor was there any difference in the number of participants categorized at a severe or greater level of symptoms. Analyses conducted on the general anxiety and four factor scores also indicated that the proportion of participants exhibiting clinical levels of symptoms was similar for the two groups. Results of the analyses indicate that Caucasians and highly acculturated, primarily Cherokee Native Americans report very similar levels

of posttraumatic symptoms, general anxiety, physiological anxiety, worry/oversensitivity, social concerns, and social desirability. The distribution of scores below and above clinical level is also very similar. In conjunction, these results indicate that the Native American children in this sample perceived and responded to these measures in a manner consistent with the norm groups, and that the norms and cutoff levels reported for these measures (Eyberg Child Behavior Inventory, The Revised Children's Manifest Anxiety Scale) are appropriate for use with highly acculturated Native Americans. However, these results may not be generalizable to Native American children with lower levels of acculturation, or those with a tribal affiliation other than Cherokee.

Analyses conducted to examine differences between these samples of Caucasians and Native Americans in the frequency of use and reported efficacy of various coping strategies were also nonsignificant. One initial difference in coping strategy frequency, in which more Native American than Caucasian children reported they would use distraction as a coping mechanism, was found. However, this difference was no longer significant after a correction for familywise error rate was made. Scores on the coping measure indicated that the children believed they would use wishful thinking, emotional regulation, and social support most often if faced with a tornado stressor. This finding is consistent with Spirito et al. (1991), who reported that these three strategies were those most often used in childhood and adolescence to deal with a variety of stressors. Social support, wishful thinking, and emotional regulation were given the highest speculative effectiveness ratings of the ten strategies measured. Although hypothetical choice of coping strategies and hypothetical evaluation of the effectiveness of those strategies might appear of little significance upon initial examination, comparison of these results with coping data gathered from a previous Oklahoma disaster sample show that the reported strategy frequencies and efficacies are fairly consistent. Children in that sample relied heavily on wishful thinking, cognitive restructuring, distraction, problem solving, and social support, and rated social support as the most effective coping strategy (Romero, 1991). The coping strategy results indicate that the Native American children in this sample report reliance upon the same coping mechanisms as Caucasian children when faced with an imagined stressor. Although much of the literature presents Native Americans

as displaying more passive coping styles, those speculations were not supported by these results. While it is true that the Native Americans in this sample were highly acculturated, and hence likely to score similar to Caucasians, comparisons of highly acculturated Native Americans to those with a lower level of acculturation also failed to find any difference in coping preferences, again supporting the conclusion that the two groups of children would rely on the same coping strategies.

The regression analysis conducted to examine relationships between coping strategy use and level of posttraumatic symptoms found that use of problem solving, wishful thinking, and self-criticism each had significant unique contributions in predicting level of posttraumatic stress symptoms. Distraction, emotional regulation, social withdrawal, cognitive restructuring, social support, resignation, and blaming others did not. While it is apparent that self-criticism would not be a beneficial coping strategy for coping with weather related stressors, and that wishful thinking would also be of limited usefulness, there is no discernable explanation for how use of problem solving could predict elevations in posttraumatic stress symptoms. It is possible that these results are unusual, and difficult to make sense of due to limitations of assessing coping to a hypothetical situation. The unusual results could also be due to possible limitations in the measurement of posttraumatic stress symptoms, which will be explained below in the discussion of national versus local norms.

Overall, the analyses conducted to examine possible differences between Caucasians and Native Americans in posttraumatic stress, general anxiety, behavior problems, and use of coping strategies did not reveal any significant differences in either average levels of symptoms, in the distribution of the study's participants below and above clinical levels, or in coping style. Therefore the nondirectional hypothesis of a significant effect of ethnicity was not supported. A major reason this study was designed to make comparative analyses of Native Americans with Caucasians was the failure of researchers to include Native Americans in the normative samples of the measures that have been frequently used to assess post-disaster adjustment. The results of this study indicate that the two groups responded to the measures used in this study in a similar manner;

consistent with the measures' respective norm groups. From this, it can be concluded that these measures are suitable for use with highly acculturated Native Americans in nondisaster samples.

Given the similarity of scores and lack of differences across measures, further analyses were performed to determine the internal consistency of these measures for each group and for the combined sample. These analyses indicated that the internal consistency is similar for both groups across the posttraumatic stress, general anxiety, and behavior problem measures. Also, the estimated reliabilities are consistent with the reported alpha coefficients for these measures (Lonigan et al., 1991; Reynolds & Richmond, 1985; Burns & Patterson, 1990). The coefficients alpha for the RCMAS four factor scores are actually higher than those reported in the RCMAS manual (Reynolds & Richmond, 1985). Only the reliability for the RI is somewhat lower, with .75 for this sample, and .83 reported for Lonigan et al., (1991).

All results (similar means, standard deviations, and reliability estimates) demonstrate that these measures are appropriate for use with highly acculturated Native Americans in nondisaster samples. It is also probable that these measures are appropriate for use with this group in disaster, and most likely, other clinical samples, as the children in this sample responded similarly to Caucasians, and hence the available norm groups, on all tests. However, the generalizability of these results may be limited to normal groups, as children with clinical levels of difficulties may respond differently to these measures. In addition, though from these analyses it could be assumed that Native Americans have levels of behavior problems, general anxiety, and posttraumatic stress equivalent to those reported for Caucasians, studies using different measures to assess these domains could produce different or contrasting results. Native Americans may in fact experience or present these disorders in a qualitatively different manner which was not tapped by the measures used in this study or cannot be tapped by measures designed to assess other ethnic groups. Differences between Native Americans and Caucasians may exist that were not assessed by this study. Generalizability of the results may also be limited to highly acculturated Native American children, and may be limited to those affiliated with Cherokee tribes.

As no significant differences were found between this sample of Caucasian and Native American subjects, for the next set of analyses, the two groups were combined to form one Oklahoma sample, which was then compared to the reported norm groups and other available samples for the problem behavior, general anxiety, and posttraumatic stress questionnaires. These analyses were conducted to test the hypothesis of a tornado sensitization effect, which would be demonstrated by Oklahoma children reporting elevated levels of posttraumatic stress symptoms, but not general anxiety or behavior problems, in comparison to national norms or nondisaster samples.

ECBI scores indicated that the children did not demonstrate elevations in mean scores for problem behavior frequency or intensity. However, approximately 11.5% of the children scored above the clinical level on this measure. Although the mean scores for the ECBI were not elevated, chi-squares conducted to compare the local sample with the ECBI national norm sample on proportions of children above and below clinical level revealed that the sample proportions were significantly different. A higher proportion of local children than norm sample children were above the clinical cutoff level for this measure. This finding did not fully support the hypothesis that the local and norm samples would not differ in level of behavior problems. This elevation in number of children above clinical level could be due to the differences between this sample and the most current ECBI standardization sample (Burns & Patterson, 1990). The Oklahoma children assessed in this study were from small towns, with some living in rural communities, while the ECBI sample was urban. The socioeconomic level in the Oklahoma sample may have been slightly lower, as the majority of Oklahoma subjects were classified in the midrange of SES (Hollingshead, 1975), but 61% of the Burns & Patterson (1990) sample came from families whose annual income level was over \$30,000. Additionally, the mean educational level (13.43, SD = 2.44) in Oklahoma was slightly lower than the norm sample (mean = 14.7, SD = 2.7). This is a rough comparison, as the ECBI sample did not report SES in terms of Hollingshead's Index, and information on the Oklahoma sample's income level was not directly assessed. Nonetheless, with the probable lower SES level of the Oklahoma sample, slight elevations in behavior problems would be expected.

On the RCMAS, children did not demonstrate elevated levels of general anxiety, or elevations on any of the RCMAS subscales (Physiological Anxiety, Social Concerns/Concentration, Worry/Oversensitivity, Lie). In the local sample, 3.3% of the children were above the clinical level for the RCMAS total T score, and 2.64% were above clinical for the Physiological Anxiety subscale. For the standardization sample, 2.5% were above clinical for both the total T score and the Physiological Anxiety subscale. Chi-squares comparing proportions above and below clinical did not detect any differences in proportions between groups. These findings supported the hypothesis that local and national samples would not differ in level of general anxiety. However, as physiological anxiety is closely related to physiological arousal in PTSD, elevations on this subscale would have supported the sensitization hypothesis, as in theory, a child who scored high on the RI would be expected to also score high on the Physiological Anxiety subscale. In this respect, the hypothesized sensitization effect was not fully supported.

For the RI, 2.64% of children reported a doubtful level of PTSD symptoms, 30.69% reported mild levels of PTSD symptoms, 43.89% reported moderate levels, 22.11% reported severe levels, and 0.33 % reported a very severe level of PTSD symptoms. The RI has not been normed on nondisaster samples, therefore, a direct comparison of the local, nondisaster sample to a national nondisaster sample could not be made. Nonstatistical comparisons between this local sample and previous Oklahoma disaster samples indicate that levels for this sample are elevated to nearly the extent of some disaster samples (Romero, 1991; Sullivan et al., 1993). Child self-reports in the Romero (1991) sample categorized 21.2% of the children as having no degree of PTSD, 52.6% as having a mild degree, and 26.3% as having a moderate degree, with no children in the severe or very severe range. Child self-reports in the Sullivan et al. (1993) sample categorized 5% as having no or "doubtful" PTSD, 39.4% as having a mild degree, 32.9% as having a moderate degree, 21.9% as having a severe degree, with no children in the very severe range. Levels in this nondisaster sample are as elevated, if not more so, than those in a sample of children who witnessed the man-made disaster of a sniper attack (Pynoos et al, 1987). In that sample, using the interview format of the RI, 39.6% of the children were classified as not having PTSD symptoms,

22% were classified as having mild levels, and 38.4% were classified as having a moderate or severe level of symptoms. The extreme elevations in degree of severity of PTSD symptoms in the Oklahoma sample supports the hypothesized sensitization effect. Elevations are so high that the sensitization effect appears very strong, and the sample resembles other samples that have experienced a disaster.

While the extreme elevations in PTSD symptoms do support a strong sensitization effect, it is possible that other factors could explain this elevation. One factor is the time of year in which these data were collected. Data collection for this sample occurred during tornado season. There could be a very large sensitization effect in tornado alley during tornado season. This effect may be diminished or nonexistent if data were to be collected outside of tornado season. Another factor is the measure used in this study to assess posttraumatic symptoms. As mentioned above, scores on the Physiological Anxiety subscale on the RCMAS were not elevated, although an elevation would be expected in those children with high levels of posttraumatic stress and physiological arousal. It is possible that the RI overpathologizes or overestimates degree of posttraumatic stress. The RI was validated in its interview format (Pynoos et al., 1987), and there have not been any published reports of validation with the self-report version. It is unclear on what the available validity reports are based, as information regarding a direct comparison of the interview and self-report versions is not available. The concurrent validity reported for disaster groups may be questionable, as detailed information on how clinicians' diagnoses of PTSD were collected is not reported. There has been no analysis conducted of discriminant validity with nondisaster groups. Although the self-report version is sensitive to differences in parent versus child reports of child PTSD symptoms (Romero, 1991; Sullivan et al., 1993), it is possible that the cutoffs suggested for degree of PTSD are set too low, overestimating severity of symptoms, and would better estimate severity if set at a higher level. Examination of the discriminant validity of this measure with disaster and nondisaster groups is needed.

As explained above, there were no significant differences found between the Caucasian and Native American samples in this study. It was determined that it was possible that no

differences were found due to the high level of acculturation of this Native American sample, which may have moderated any potential differences that might exist between the two groups. To explore how acculturation may influence levels of symptoms and reported choice and efficacy of coping strategies, all Native American Acculturation variables (Spiritual/Religious, Social/Recreation, Training/Education, and Family/Self, Native American Total Acculturation Score) were correlated with the dependent variable total scores (ECBI frequency and efficacy scores, RI total score, RCMAS raw total score, RCMAS total calculated T score, RCMAS scaled scores, Kidcope frequency and efficacy scores). After corrections were made for familywise error rate, initial differences were no longer significant. Speculation on trends may not be meaningful at this time.

In summary, this study did not find any differences between Caucasian and highly acculturated, predominantly Cherokee Native American children. The similarity of the children's scores, the distributions of the children's scores, and the internal consistency estimates indicate that highly acculturated Native American children (attending public school; urban, not reservation, residence) respond to the study's measures in the same manner as Caucasian children. The manner in which they respond is also consistent with the measures' norm samples and other samples tested with these measures in the disaster literature. All results indicate that these measures are appropriate for use with highly acculturated Native Americans in nondisaster samples. Due to the high similarity, it is also possible that these measures are appropriate for use with this group in disaster and other clinical samples as well, however, this would hypothesis requires further empirical examination.

In addition to demonstrating that these measures are appropriate for use with highly acculturated Native American children, these results also indicate that these children have levels of these problems that are consistent with those reported for the norm samples (primarily Caucasian) for questionnaires that assess behavior problems and general anxiety. However, this finding would have to be cross-validated with other measures assessing these domains. Native American children may experience behavior problems, anxiety, and posttraumatic stress in a manner that is qualitatively different from how it was conceptualized and assessed in this study. Further thorough

assessment of a variety of Native American populations, with different types of assessments, including an open-ended interview format, is necessary. It must be noted that the Native American children in this study are not representative of all Native American children. The Native American children in this study were highly acculturated, attending public schools, and living in small town, not reservation, settings. Although many tribal affiliations were represented, the majority of children were in the study were Cherokee. Children with other tribal affiliations or other levels of acculturation may respond differently than did this specific group.

While the non-directional hypothesis of differences between Caucasian and Native American children was not supported, the sensitization hypothesis was supported. The results of the study support a strong tornado sensitization effect for children living in Oklahoma, an area with frequent tornadic activity. Children in this study had elevations in PTSD symptoms that were similar to elevations found in previous disaster samples, but did not have mean elevations in generalized anxiety or behavior problems. Again, this effect may be an artifact of the time of year in which data was collected, or of the questionable validity of the measure this study used to assess posttraumatic symptoms. Results may differ if this study were replicated at a time outside of tornado season, or replicated with a different posttraumatic stress measure.

In general, there are several limitations to this study which must be noted. Of primary importance is the fact that the Reaction Index had not been previously normed on a nondisaster sample. This limited the ability of this study to directly assess the hypothesized sensitization effect, as direct comparisons of this nondisaster group to other nondisaster groups could not be made. This sample could only be compared to other Oklahoma disaster samples and to disaster samples that used the RI that are presently available in disaster literature. Further validation of the self-report version of the RI is needed, with both disaster and nondisaster groups. The sensitization effect supported by this study should also be re-examined under various conditions, such as data collection occurring at a different time of year, so that the experiences of tornado season, such as tornado drills, extensive tornado television coverage, are not so prevalent. Comparison of Oklahoma children with children residing in areas of the country without high tornado frequency

and extensive television coverage would also serve to provide further information on the sensitization hypothesis and on the validity of the RI. Also, research using other posttraumatic questionnaires in conjunction with the RI would provide additional information on its validity and that of the sensitization effect. If upon further examination the RI is found to provide valid measurement of posttraumatic stress symptoms and accurate estimation of the symptoms' severity, additional research should be conducted with disaster samples to examine possible relationships between coping and level of posttraumatic symptoms.

Significant strengths of this study should also be noted. This study collected data on Native American children, who have been neglected in the norm samples of many psychological measures, and examined the appropriateness of use of well-accepted measures with highly acculturated Native American children. This study also gathered information on acculturation and tribal affiliation for the Native American sample, to provide specific description of the sample, as Native Americans may differ by level of acculturation and by tribe. Although much more detailed examination, including larger samples, different levels of acculturation, different tribal affiliations, and using multiple other assessments, is necessary before an adequate understanding of Native American cultures is obtained, this study provided an important start.

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APPENDIX A

Tables

Table 1

Demographic and Child Tornado Experience Means and Standard Deviations

	Caucasian n = 153		Native American n = 150	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Responding Parent (Female, Married)				
Age	36.06	5.87	35.63	6.02
Years of Education	13.46	2.44	13.41	2.44
Other Parent				
Age	37.94	6.89	37.97	7.29
Years of Education*	13.65	2.35	12.94	2.85
SES**	38.71	13.99	36.34	13.21
Children	76 boys 77 girls		70 boys 80 girls	
Child Age (in months)	130.49	13.96	131.41	14.46
Previous Direct Tornado Experience	129 No 24 Yes		128 No 22 Yes	
Number of Tornadoes Experienced	1.20	.50	1.27	.63
Fear During Exposure	1.25	.94	1.05	.84
Worry Since Tornado	1.17	.70	1.14	.71

Note. *denotes a significant difference between groups at the $p < .05$. See text for values. ** Denotes socioeconomic status as calculated by the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975). SES is calculated from occupational level, educational level, sex, and marital status. Scores reported are at the skilled craftsmen, clerical and sales worker level. Number of tornadoes experienced, fear during exposure, and worry since tornado are based on the number of children reporting previous tornado experience:

Key. Fear During Exposure: "During the tornado(s), how scared was your child? 0 = not scared at all, 1 = somewhat scared, 2 = very scared, 3 = terrified. Worry Since Tornado: "Since the tornado(s), is your child scared or worried about storms?" 0 = not scared at all, 1 = somewhat scared, 2 = very scared, 3 = terrified.

Table 2

Native American Tribal Affiliations for Responding Parents, Other Parents, and Children

<u>Tribal Affiliation</u>	<u>Responding parent</u>	<u>Other Parent</u>	<u>Child</u>
Cherokee	78	53	105
Creek/Cherokee	3	1	2
Cherokee/Delaware	4	1	5
Shawnee/Delaware		1	1
Quapaw/Choctaw	1		1
Chickamauga	1		1
Choctaw/Chickamauga	1		1
Choctaw/Chickamauga/Cherokee			1
Choctaw/Cherokee	1	1	
Otoe/Pawtaw	1		1
Navajo		1	1
Navajo/Cherokee			2
Sac & Fox	1		1
Cherokee/Hispanic			2
Seminole/Creek		1	1
Other	3	3	4

Note. Other represented in sample = Seminole/Cherokee, Yakama/Cherokee, Cherokee/Osage, Creek/Shawnee/Pawtaw, Chickasaw, Choctaw, Cherokee/Eskimo, Caddo/Delaware, Cherokee/Creek/ Caddo/Delaware, Cherokee/Choctaw/Klinket.

Table 3

Native American Acculturation Scale Results

<u>Domain</u>	<u>M</u>	<u>SD</u>
Spiritual/Religious	3.23	.80
Social/Recreational	3.16	.68
Training/Education	3.08	1.04
Family/Self	3.12	.86
Total Acculturation	12.63	2.32
Average Acculturation	3.16	.58

Note. Range of the domains is 1 (highly enculturated in Native American culture) to 4 (highly acculturated in mainstream U.S. culture). Total Acculturation is the sum of the four domains.

Table 4

Analysis of Covariance for the Eyberg Child Behavior Inventory (ECBI)

ECBI Frequency Score

Source of Variation	<u>SS</u>	<u>df</u>	<u>MS</u>	F	Significance
Covariate - SES Index	3897.47	1	3897.47	3.83	.05
Main Effects - Ethnicity	402.14	1	402.14	.40	.53
Explained	4299.62	2	2149.81	2.11	.12
Residual	91164.33	286	1018.06		
Total	295463.95	288	1025.92		

ECBI Problem Score

Source of Variation	<u>SS</u>	<u>df</u>	<u>MS</u>	F	Significance
Covariate - SES Index	644.09	1	644.09	12.16	.00
Main Effects - Ethnicity	7.43	1	7.43	.14	.71
Explained	651.52	2	325.76	6.15	.00
Residual	15148.35	286	52.97		
Total	15799.87	288	54.86		

Note. SES Index is the Hollingshead Index (Hollingshead, 1975).

Table 5

Chi-Square Analyses for Group Differences in Degree of PTSD Symptoms as Measured by the Reaction Index

<u>Degree of PTSD Symptoms</u> <u>(Scores = 0-80)</u>	<u>Group</u>		
	<u>Caucasians</u> <u>N = 153</u>	<u>Native Americans</u> <u>N = 149</u>	
No PTSD (range 0-11)	2	6	
Mild PTSD (range 12-24)	49	44	
Moderate PTSD (range 25-39)	68	65	
Severe PTSD (range 40-59)	33	34	
Very Severe PTSD (range 60-80)	1	0	
<u>Chi-Square</u>	<u>Value</u>	<u>DF</u>	<u>Significance</u>
Pearson	3.30	4	.51

Note. Degree of PTSD is according to published scoring criteria for the Reaction Index (Frederick, Pynoos, & Nader, 1992).

Table 6

Anxiety MANCOVA

<u>Dependent Variable</u>	<u>Covariate SES Index</u>	
	<u>F</u>	<u>Significance</u>
RI total score	2.02	.16
RCMAS raw total score	4.87	.03*
RCMAS total T score	3.84	.05*
Physiological Anxiety scaled score	6.76	.01*
Worry/Oversensitivity scaled score	1.05	.31
Social Concerns/Concentration scaled score	2.73	.10
Lie scaled score	2.18	.14

Effect . . Child Ethnicity

Univariate F-tests with (1,285) df.

<u>Variable</u>	<u>Caucasian</u>	<u>Native American</u>	<u>F</u>	<u>p</u>
RI	<u>M</u> = 30.19	<u>M</u> = 29.44	.63	.43
RCMAS	<u>M</u> = 50.35	<u>M</u> = 50.60	.00	.98
Physiological Anxiety	<u>M</u> = 9.53	<u>M</u> = 9.70	.02	.90
Worry/ Oversensitivity	<u>M</u> = 9.89	<u>M</u> = 9.95	.07	.78
Social Concerns/ Concentration	<u>M</u> = 9.26	<u>M</u> = 9.50	.27	.60
Lie	<u>M</u> = 10.47	<u>M</u> = 10.41	.01	.92

Note. * denotes significance at $p \leq .05$.

Table 7

Kidcope Frequency and Efficacy Endorsements

<u>Strategy</u>	<u>Frequency</u> <u>Would You Do This?</u>		<u>Efficacy</u> <u>If Yes, How Much Would It Help?</u>		
	<u>No (%)</u>	<u>Yes (%)</u>	<u>None (%)</u>	<u>Little (%)</u>	<u>Lot (%)</u>
Distraction	13.2	86.8	6.5	46.2	47.3
Problem Solving	11.6	88.4	4.1	47.9	47.9
Emotional Regulation	7.6	92.4	5.4	43.4	51.3
Wishful Thinking	5.6	94.4	17.5	30.9	51.6
Social Withdrawal	83.8	16.2	35.3	43.1	21.6
Cognitive Restructuring	10.3	89.7	8.1	42.8	49.1
Social Support	9.3	90.7	3.3	35.8	60.9
Resignation	65.6	34.4	26.9	46.2	26.9
Self Criticism	90.1	9.9	43.3	33.3	23.3
Blaming Others	89.7	10.3	25.8	32.3	41.9

Table 8

Summary of Stepwise Regression Analysis for Kidcope Frequency Scores Predicting the Reaction Index Total Score

(N = 302)

<u>Variable</u>	<u>Multiple R</u>	<u>R²</u>	<u>Adjusted R²</u>	<u>F</u>	<u>Significance of F</u>	<u>B</u>	<u>Se B</u>	<u>Beta</u>
Step 1	.30	0.1	0.06	19.91	0			
Problem Solving						8.84	1.98	.25
(Constant)						22.00	1.86	
Step 2	.30	.09	.09	15.11	.00			
Problem Solving						6.81	2.06	.19
Wishful Thinking						8.91	2.86	.18
(Constant)						15.38	2.81	
Step 3	.33	.11	.10	12.40	.00			
Problem Solving						7.16	2.04	.20
Wishful Thinking						8.53	2.84	.17
Self Criticism						5.27	2.08	.14
(Constant)						14.90	2.79	

Note: Variables not entered into the equation were: Distraction, Emotional Regulation, Social Withdrawal, Cognitive Restructuring, Social Support, Resignation, and Blaming others.

APPENDIX B

Form A - Parent Demographics Form

FORM A - PARENT FORM

1) Your relationship to the child: Mother _____ Father _____ Other _____
(Please Describe Above)

2) Your sex: M _____ F _____

3) Your age: _____

4) Your race: White _____ Black _____ Hispanic _____ Asian _____
Native American _____ Other _____

If you are Native American, please list your tribal affiliation or identification

5) Highest level of education completed (circle year):

1 2 3 4 5 6 7 8 (Grade School)

9 10 11 12 (High School)

13 14 15 16 (College)

17 and over (Graduate School)

6) Occupation: _____

7) Marital Status: single _____ married _____ divorced _____ separated _____

8) If married, please provide the following information about your spouse:

a) Relationship to the child: _____

b) Age: _____

c) Race: White _____ Black _____ Hispanic _____ Asian _____

Native American _____ Other _____

d) If your spouse is Native American, please list his/her tribal affiliation or identification

e) Highest level of education completed (circle year):

1 2 3 4 5 6 7 8 (Grade School)

9 10 11 12 (High School)

13 14 15 16 (College)

17 and over (Graduate School)

f) Spouse's occupation: _____

9) Please provide the following information about the child:

a) Date of birth: _____

b) Sex: M _____ F _____

c) Race: White _____ Black _____ Hispanic _____ Asian _____

Native American _____ Other _____

If your child is Native American, please list his/her tribal affiliation or identification below and complete the attached questionnaire to describe your involvement within Native American communities.

10) Has your family (including your child) ever been in a tornado? Yes ___ No ___

If yes, please answer the questions below. If not, please skip to the next form.

a) How many times has your family been in a tornado? ___

For each tornado your family has been in, how old was your child when it happened?

first tornado ___ second tornado ___ third tornado ___

b) For the last or most recent tornado, how much damage did the tornado cause to your home? Circle one.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

c) How long were you not able to live in your home? _____

d) During the tornado, where was your child?

- ___ at home
- ___ at school
- ___ at friend's or relative's house
- ___ at shelter
- ___ other _____

e) How much damage occurred at your child's location?

None Little Moderate Major Total

f) During the tornado, was your child separated from his/her mother?

___ Yes ___ No

g) During the tornado, was your child separated from his/her father?

___ Yes ___ No

h) During the tornado, how scared was your child? (circle one)

Not at all Scared Somewhat Scared Very Scared Terrified

i) Since the tornado, is your child scared or worried about storms?

Not at all Scared Somewhat Scared Very Scared Terrified

Please describe: _____

11) Please provide any additional information related to your child's experience with tornadoes that may have had an impact on him/her:

APPENDIX C
Eyberg Child Behavior Inventory

ID# _____

Instructions: Below are a series of phrases that describe children's behavior. Please (1) circle the number describing how often the behavior currently occurs with your child, and (2) circle "yes" or "no" to indicate whether the behavior is currently a problem for you.

	How often does this occur with your child?							Is this a problem for you?	
	<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>			<u>Yes</u>	<u>No</u>
1. Dawdles in getting dressed.....	1	2	3	4	5	6	7	Yes	No
2. Dawdles or lingers at mealtimes.....	1	2	3	4	5	6	7	Yes	No
3. Has poor table manners.....	1	2	3	4	5	6	7	Yes	No
4. Refuses to eat food presented.....	1	2	3	4	5	6	7	Yes	No
5. Refuses to do chores when asked.....	1	2	3	4	5	6	7	Yes	No
6. Slow in getting ready for bed.....	1	2	3	4	5	6	7	Yes	No
7. Refuses to go to bed on time.....	1	2	3	4	5	6	7	Yes	No
8. Does not obey house rules on own.....	1	2	3	4	5	6	7	Yes	No
9. Refuses to obey until threatened with punishment.....	1	2	3	4	5	6	7	Yes	No
10. Acts defiant when told to do something.....	1	2	3	4	5	6	7	Yes	No
11. Argues with parents about rules.....	1	2	3	4	5	6	7	Yes	No
12. Gets angry when doesn't get his/her own way.....	1	2	3	4	5	6	7	Yes	No
13. Has temper tantrums.....	1	2	3	4	5	6	7	Yes	No
14. Sasses adults.....	1	2	3	4	5	6	7	Yes	No
15. Whines.....	1	2	3	4	5	6	7	Yes	No
16. Cries easily.....	1	2	3	4	5	6	7	Yes	No
17. Yells or screams.....	1	2	3	4	5	6	7	Yes	No
18. Hits parents.....	1	2	3	4	5	6	7	Yes	No
19. Destroys toys and other objects.....	1	2	3	4	5	6	7	Yes	No
20. Is careless with toys and other objects.....	1	2	3	4	5	6	7	Yes	No
21. Steals.....	1	2	3	4	5	6	7	Yes	No

	How often does this occur with your child?						Is this a <u>problem for you?</u>		
	<u>Never</u>	<u>Seldom</u>	<u>Sometimes</u>	<u>Often</u>	<u>Always</u>	<u>Yes</u>	<u>No</u>		
22. Lies.....	1	2	3	4	5	6	7	Yes	No
23. Teases or provokes other children.....	1	2	3	4	5	6	7	Yes	No
24. Verbally fights with friends his/her own age.....	1	2	3	4	5	6	7	Yes	No
25. Verbally fights with sisters and brothers.....	1	2	3	4	5	6	7	Yes	No
26. Physically fights with friends his/her own age.....	1	2	3	4	5	6	7	Yes	No
27. Physically fights with sisters and brothers.....	1	2	3	4	5	6	7	Yes	No
28. Constantly seeks attention.....	1	2	3	4	5	6	7	Yes	No
29. Interrupts.....	1	2	3	4	5	6	7	Yes	No
30. Is easily distracted.....	1	2	3	4	5	6	7	Yes	No
31. Has short attention span.....	1	2	3	4	5	6	7	Yes	No
32. Fails to finish tasks or projects.....	1	2	3	4	5	6	7	Yes	No
33. Has difficulty entertaining himself/herself alone....	1	2	3	4	5	6	7	Yes	No
34. Has difficulty concentrating on one thing.....	1	2	3	4	5	6	7	Yes	No
35. Is overactive or restless.....	1	2	3	4	5	6	7	Yes	No
36. Wets the bed.....	1	2	3	4	5	6	7	Yes	No

APPENDIX D

Native American Acculturation Measure

Please complete this form if you and/or your child is of Native American descent.
 Directions: For each line, please circle the number of the comment which best describes your family.

Adapted from Brown, S. (1982, May). Native generations diagnosis and placement on the conflicts/resolution chart. Paper presented at the annual meeting of the School of Addiction Studies, University of Alaska-Anchorage.

Brown, 1982/1986

Spiritual/religious

1	2	3	4
Regular ceremonies	Knowledge of Ceremonies	Belief + irregular church attendance	Regular church attendance

Social/recreational

1	2	3	4
All leisure with Native peoples	Prefers leisure time with Native peoples within NA community; enjoys activities with Native peoples outside of NA community	Most leisure time outside of Indian community. Occasional PowWows, etc.	Prefers leisure time exclusively outside of Indian community

Training/education

1	2	3	4
Unstructured setting preferred (elders); listen/observe. No formal education	Listen/observe preferred. Some formal education	Prefers structured classroom with movies, speakers. Dislike written evaluation of knowledge/skills	Prefers classroom setting with formal lectures, didactics, written evaluation

Family/self

1	2	3	4
Relationships with extended family and tribe exclusively	Relationships only with extended family. Strong identification with tribal background	Relationships restricted to parents, sibs, spouse/children. Identification but little contact with tribe	Relationships with primary family, spouse/children. Occasional contact with sibs, grandparents

APPENDIX E
Frederick Reaction Index
Form C

ID# _____

Below are some statements about how children and adolescents might react to the stress of tornadoes. For each one, circle the number to show how much of the time it would be true for you.

	None of the <u>Time</u>	Little of the <u>Time</u>	Some of the <u>Time</u>	Much of the <u>Time</u>	Most of the <u>Time</u>
1. I feel tornadoes are so bad they would upset most youngsters.	_____	_____	_____	_____	_____
2. I feel afraid or upset with thoughts about tornadoes.	_____	_____	_____	_____	_____
3. I go over in my mind what happens with tornadoes - keep seeing pictures or hearing the sounds.	_____	_____	_____	_____	_____
4. I have bad thoughts about tornadoes even though I don't want to.	_____	_____	_____	_____	_____
5. I have bad dreams about tornadoes.	_____	_____	_____	_____	_____
6. Things sometimes make me think that a tornado might happen again.	_____	_____	_____	_____	_____
7. I feel as good about things I like to do, even though tornadoes exist.	_____	_____	_____	_____	_____
8. I feel more alone inside; other people don't really understand how I'm feeling.	_____	_____	_____	_____	_____
9. I feel so scared or sad sometimes that I don't really want to know how I feel.	_____	_____	_____	_____	_____
10. I feel so scared or sad about tornadoes I can't even talk or cry about it.	_____	_____	_____	_____	_____
11. I'm more jumpy or nervous because of tornadoes (startled at loud noises).	_____	_____	_____	_____	_____
12. I sleep well.	_____	_____	_____	_____	_____
13. I feel bad that I can't do something to stop tornadoes from happening or to help.	_____	_____	_____	_____	_____
14. I remember things well; thoughts or feelings about tornadoes do not make me forget things I learn in school.	_____	_____	_____	_____	_____
15. It's easy to pay attention even though tornadoes exist.	_____	_____	_____	_____	_____
16. I want to stay away from things that make me think about tornadoes.	_____	_____	_____	_____	_____
17. When something makes me think about tornadoes I get tense or upset.	_____	_____	_____	_____	_____
18. Things happen that warn me that a tornado is coming.	_____	_____	_____	_____	_____
19. Because of thinking about tornadoes, I have stomachaches, headaches, or other signs of illness.	_____	_____	_____	_____	_____
20. I do <u>not</u> behave recklessly or take chances.	_____	_____	_____	_____	_____

APPENDIX F

Revised Children's Manifest Anxiety Scale

1. I have trouble making up my mind	Yes	No
2. I get nervous when things do not go the right way for me.....	Yes	No
3. Others seem to do things easier than I can.....	Yes	No
4. I like everyone I know	Yes	No
5. Often I have trouble getting my breath	Yes	No
6. I worry a lot of the time	Yes	No
7. I am afraid of a lot of things	Yes	No
8. I am always kind.....	Yes	No
9. I get mad easily	Yes	No
10. I worry about what my parents will say to me	Yes	No
11. I feel that others do not like the way I do things	Yes	No
12. I always have good manners	Yes	No
13. It is hard for me to get to sleep at night	Yes	No
14. I worry about what other people think about me	Yes	No
15. I feel alone even when there are people with me	Yes	No
16. I am always good	Yes	No
17. Often I feel sick in my stomach	Yes	No
18. My feelings get hurt easily	Yes	No
19. My hands feel sweaty	Yes	No
20. I am always nice to everyone	Yes	No
21. I am tired a lot.....	Yes	No
22. I worry about what is going to happen	Yes	No
23. Other people are happier than I.....	Yes	No
24. I tell the truth every single time	Yes	No
25. I have bad dreams	Yes	No
26. My feelings get hurt easily when I am fussed at.....	Yes	No
27. I feel someone will tell me I do things the wrong way	Yes	No
28. I never get angry	Yes	No
29. I wake up scared some of the time	Yes	No
30. I worry when I go to bed at night	Yes	No
31. It is hard for me to keep my mind on my schoolwork.....	Yes	No
32. I never say things I shouldn't	Yes	No
33. I wiggle in my seat a lot.....	Yes	No
34. I am nervous.....	Yes	No
35. A lot of people are against me	Yes	No
36. I never lie.....	Yes	No
37. I often worry about something bad happening to me	Yes	No

APPENDIX G

Kidcope

Instructions: We are interested in trying to find out how people deal with tornadoes. Below is a problem that you might have had with tornadoes. Please read the following description and then answer the questions below:

There has been a tornado in your town. It caused quite a bit of damage in the town. For example, your school may have been damaged so that classes had to be canceled, the building where you take dance or karate has been damaged, or your home might have been damaged. Now you are trying to adjust to the effects of the tornado.

1. Have you ever had a problem like this? Yes No
2. Would this situation make you nervous?
Not at all A little Somewhat Pretty much Very much
3. Would this situation make you sad?
Not at all A little Somewhat Pretty much Very much
4. Would this situation make you mad?
Not at all A little Somewhat Pretty much Very much

Now, imagine this just happened to you. Please turn to the next page and circle whether you would use any of the following ways to help deal with this problem.

Instructions: For each statement below, circle "yes" or "no" to show if you would use that way of coping with the problem. Then show how much it would help by circling "None", "Little", or "Lot".

	Would You Do This?		If YES, How Much Would It Help?		
	Yes	No	None	Little	Lot
1. I would just try to forget it.	Yes	No	None	Little	Lot
2. I would do something like watch TV or play a game to forget it.	Yes	No	None	Little	Lot
3. I would stay by myself.	Yes	No	None	Little	Lot
4. I would keep quiet about the problem.	Yes	No	None	Little	Lot
5. I would try to see the good side of things.	Yes	No	None	Little	Lot
6. I would blame myself for causing the problem.	Yes	No	None	Little	Lot
7. I would blame someone else for causing the problem.	Yes	No	None	Little	Lot
8. I would try to fix the problem by thinking of answers.	Yes	No	None	Little	Lot
9. I would try to fix the problem by doing something or talking to someone.	Yes	No	None	Little	Lot
10. I would yell, scream, or get mad.	Yes	No	None	Little	Lot
11. I would try to calm myself down.	Yes	No	None	Little	Lot
12. I would wish the problem had never happened.	Yes	No	None	Little	Lot
13. I would wish I could make things different.	Yes	No	None	Little	Lot
14. I would try to feel better by spending time with others like family, grownups, or friends.	Yes	No	None	Little	Lot
15. I wouldn't do anything because the problem can't be fixed.	Yes	No	None	Little	Lot

APPENDIX H

Institutional Review Board Approval Form

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Local Norms
79

Date: 10-03-94

IRB#: AS-95-011

Proposal Title: LOCAL NORMS FOR POST-TRAUMATIC STRESS, GENERALIZED ANXIETY, AND PROBLEM BEHAVIORS IN A DISASTER-PRONE AREA: AN INVESTIGATION OF THE APPROPRIATENESS OF NATIONAL STANDARDIZATION NORMS FOR USE WITH DISASTER AND NATIVE AMERICAN SAMPLES

Principal Investigator(s): Maureen A. Sullivan, Raquel T. Romero

Reviewed and Processed as: Expedited

Approval Status Recommended by Reviewer(s): Approved

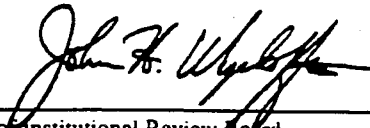
APPROVAL STATUS SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.

APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.

ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

Signature:



Chair of Institutional Review Board

Date: October 11, 1994

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VITA

Raquel T. Romero

Candidate for the Degree of

Doctor of Philosophy

Thesis: LOCAL NORMS FOR POSTTRAUMATIC STRESS, GENERALIZED ANXIETY, AND PROBLEM BEHAVIORS IN A TORNADO-PRONE AREA: AN INVESTIGATION OF THE APPROPRIATENESS OF NATIONAL STANDARDIZATION NORMS FOR USE WITH DISASTER AND NATIVE AMERICAN SAMPLES

Major Field: Psychology

Biographical:

Personal Data: Born in Tulsa, Oklahoma, On June 26, 1968, the daughter of Ruth McClurg Romero and Agustin (Tino) Romero, Jr.

Education: Graduated from Memorial High School, Tulsa, Oklahoma, in May 1986; received Bachelor of Arts degree in Psychology and a Master of Science degree from Oklahoma State University, Stillwater, Oklahoma in August 1990 and May 1994, respectively. Completed the requirements for the Doctor of Philosophy degree with a major in Clinical Psychology at Oklahoma State University in May 1997.

Experience: Clinical Psychology Internship/Residency at the University of Texas Medical Branch at Galveston Psychology Internship Training Program, 1995-1996.

Professional Memberships: American Psychological Association, Association for Advancement of Behavior Therapy