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REVIEWING SUICIDE IN NATIVE AMERICAN COMMUNITIES: SITUATING RISK AND PROTECTIVE FACTORS WITHIN A TRANSACTIONAL–ECOLOGICAL FRAMEWORK

CARMELA ALCÁNTARA and JOSEPH P. GONE
University of Michigan, Ann Arbor, Michigan, USA

The alarming prevalence of suicidal behaviors in Native American communities remains a major concern in the 21st-century United States. Recent reviews have demonstrated that prevention programs and intervention efforts using transactional–ecological models have effectively reduced suicidal behaviors in the American Indian and Alaska Native populations sampled. As a result, this article adopts a transactional–ecological framework for conceptualizing suicidality and identifying points of intervention. Drawing on the most current empirical reports, the epidemiology of Native American suicidal behaviors is reviewed, while situating risk and protective factors within a biopsychosocial framework. Opportunities for intervention are discussed with a focus on the interactions between individuals and their environments, and the antecedent conditions leading to zones of heightened suicide risk.

> There is nothing more significant going on in your community than this [suicide] crisis. Defending treaty rights, fighting for sovereignty—none of that matters if we're not dealing with these problems, and I tell you these problems are not just here on Standing Rock.
>
> — Kevin Gover, Assistant Secretary for Indian Affairs (Olson, 1998, p. 01A)

For the residents of the Standing Rock Sioux reservation along the North Dakota–South Dakota border, the winter months in 1997 and 1998 were plagued with disbelief, anger, and fear stemming from a suicide epidemic that culminated in 37 attempts among adolescent youth and 5 completed suicides by adolescent

Received 10 July 2006; accepted 10 October 2006.
Address correspondence to Carmela Alcántara, Department of Psychology, University of Michigan, Ann Arbor, MI 48109. E-mail: calcan@umich.edu

males. At the height of this epidemic, an estimated 150 at-risk adolescents were monitored by mental health professionals, relatives, and other tribal members. Additional risks stemming from the unknown influence of suicide pacts and contagion effects were also difficult to manage. In the aftermath of these teen suicides, the Standing Rock Sioux community—along with tribal leaders and federal officials—conferred to strategize suicide prevention measures, including but not limited to the opening of youth recreation centers, the tailoring of mental health services for depression and substance use, as well as a more general rebuilding of reservation life. The suicide crisis and subsequent prevention efforts at Standing Rock are but one example of many similar instances throughout "Indian Country." This situation illustrates the growing concern regarding the alarming prevalence of suicidal behaviors among American Indian and Alaska Native (AI/AN) communities in the United States.

Suicide is also a serious public health concern in the United States more broadly, with current statistics indicating that it is the eighth leading cause of death in American society (U.S. Department of Health & Human Service, 2001). Given the significant personal and societal toll of death by suicide, the 21st century has already witnessed a considerable rise in national attention aimed toward the prevention of suicide. Federal efforts such as the *U.S. Surgeon General's Call to Action* and the *National Strategy for Suicide Prevention* have served as catalysts for the mobilization of suicide prevention programs nation-wide (U.S. Department of Health & Human Service, 1999, 2001). Suicide is no longer perceived as just the concern of individuals and their families, but also of the public at large, with increasing prioritization of suicide research and prevention programming. Nonetheless, this newfound emphasis on suicide prevention efforts has been slow to reach the Native American communities at highest risk, and hopeful outcomes, though anticipated, are not ensured. Echoing the statement at the outset of this article by former head of the Bureau of Indian Affairs and esteemed Native judiciary figure and law professor, Kevin Gover, it is time that suicidality in Indian Country is addressed by research, prevention programming, treatment, and outcome evaluation. In order to move beyond the specter of untimely death toward more inclusive healing, Native American suicide can no longer remain a neglected phenomenon.

Predicting Suicide: Implications for Treatment

The expectation that trained mental health professionals can predict an individual suicide is a common but erroneous perception that has endured among clinicians and clients alike. The probabilities for accurately predicting extremely low base-rate occurrences or statistically rare occurrences such as suicide are remarkably low (Rudd, Joiner, & Rajab, 2000). Essentially, any discussion of suicide must occur in tandem with this more general understanding of low-probability incidents. As explicitly stated by Rudd et al.:

> Low base-rate phenomena such as suicide are impossible to predict with any reliability in the individual case, simply by nature of the statistical problem presented. Actually, we would be correct more often than not simply to predict that a patient *would not* commit suicide, regardless of the clinical presentation. (p. 127)

In sum, appreciation of a statistical approach to suicide highlights the inability for clinicians to accurately predict suicide. This limitation underscores the importance of intervention efforts that include reliable risk assessments. These types of assessment strategies identify salient risk factors that place individuals or communities within "suicide zones" (as coined by Litman, 1990, in Rudd et al.) or elevated periods of suicide risk, as well as corresponding theaters of intervention (clinical treatment, management, etc). According to Litman, the severity of the suicide risk zone is dependent on the presence or absence of psychiatric conditions, type and intent of suicidal behavior (ideation, plan, or gesture), risk factors, and identifiable protective factors, which converge to acutely raise the risk for suicide.

Paradoxically, any "treatment" for suicide must necessarily occur before the act itself. Postmortem intervention efforts are obviously impossible, because suicide cannot be prevented in the deceased. It is fundamental then to locate opportunities for prevention along developmental pathways that lead individuals to heightened suicide risk zones. In this light, identifying risk and protective factors within a biopsychosocial frame of reference is vital in determining points of preventive intervention and understanding an individual's potential for suicide.

Drawing upon the most current empirical reports on suicidal behaviors and preventive interventions, this article offers a brief

review of the epidemiological profile of suicide in AI/AN communities, while situating biopsychosocial risk and protective factors for suicide within a transactional–ecological framework. The transactional–ecological framework (Felner & Felner, 1989) is an approach to prevention that targets the interactions between individuals and their environments along developmental trajectories toward negative outcomes. That is, this approach to prevention explicitly disavows person-focused interventions as "victim blaming" and instead targets problematic transactions between people and their environments. Moreover, this approach rejects a disease prevention model of intervention in favor of efforts that target broad-based antecedent conditions that might lead to any number of undesirable outcomes (e.g., school failure, teenage pregnancy, substance abuse) over time without necessarily yielding any specific developmental outcome (e.g., suicide) in reliable ways. Two recent reviews of suicide programs in Native communities (May, Serna, Hurt, & DeBruyn, 2005; Middlebrook, LeMaster, Beals, Novins, & Manson, 2001) have demonstrated the need for and effectiveness of prevention efforts that draw upon a transactional-ecological approach using community-based models. Given the alarming prevalence of suicide completions and suicidal behaviors among AI/ANs, situating suicidality within a transactional–ecological framework is important for determining effective points of intervention.

Epidemiology of Suicidal Behaviors among AI/ANs

The latest U.S. Census Bureau report estimates that 4.1 million AI/ANs live in the United States, comprising approximately 1.5% of the U.S. population (U.S. Census Bureau, 2002). Furthermore, according to Census reports there are over 561 federally recognized tribes speaking over 220 indigenous languages with various dialects. The marked heterogeneity within the AI/AN population contradicts common misperceptions of homogeneity across Native American communities and renders the making of generalizations problematic (Gone, 2003, 2004b). Thus, the cultural heterogeneity of AI/ANs should remain at the forefront of any consideration of suicide intervention programs targeting these populations (Gone, 2004a).

Although a detailed account of the epidemiology of suicide among indigenous persons in the United States is beyond the

scope of this article (refer to Olson & Wahab, 2006, for a thorough synthesis of the epidemiological profile and relevant risk factors correlated with AI/AN suicide), a brief discussion of the demographic profile of suicidality in Indian Country is presented to provide the necessary context. Current mortality statistics reveal that suicide is the second leading cause of death for AI/AN populations aged 15 to 24 years of age, the third leading cause of death for ages 5 to 14 and 25 to 44 years of age, and the eighth leading cause of death for decedents of all ages (Centers for Disease Control & Prevention, 2003; Indian Health Service [IHS], 2000–2001a, 2000–2001b). In addition, the age-adjusted suicide death rate for AI/ANs is 20.2 per 100,000, approximately twice as high as the U.S. all-races rate of 10.6 per 100,000, with males accounting for the majority of suicide decedents (IHS, 2000–2001a, 2000–2001b). Regional variations among the IHS areas have also emerged. The highest suicide death rates (ranging 5 to 7 times higher than the overall U.S. rates) are documented in the Tucson, Arizona, Aberdeen, and Alaska service areas. Contrastingly, the lowest suicide rates were found in the California, Nashville, Tennessee, and Oklahoma service areas (Centers for Disease Control, 2003; IHS 2000–2001a, 2000–2001b). The leading method of suicide among the AI/AN youth was death by firearms followed by hanging. Of interest, suicide death rates remained relatively unchanged during the 1989–1998 year period examined within the Centers for Disease Control report. Already apparent from this brief review of the epidemiological landscape of AI/AN suicide is the regional variation in suicide death rates for indigenous peoples in the United States. Consequently, determining suicide risk zones and appropriate points of intervention is likely to change in relation to the specific suicidality profile of the region.

A detailed portrait of the epidemiology of suicidality in AI/AN communities also takes into account the prevalence of the spectrum of suicidal behaviors such as suicide ideation and suicidal attempts. Generally, the ratio of suicide ideation and attempts to suicide completion is overwhelmingly high, with far more cases of suicide ideation and attempts occurring in contrast to completed suicides. Although there are few authoritative population-based studies of the prevalence of suicide attempts and suicidal ideation for AI/AN communities (for a brief review of education studies, refer to LeMaster, Beals, Novins, Manson, & the AI-SUPERPFP

Team, 2004), a high prevalence of suicidal behaviors has been documented among AI/AN adolescents and young adults, with higher rates found among AI/AN females. Specifically, LeMaster and colleagues found that within a Northern Plains community-based AI reservation sample, females and younger respondents endorsed significantly higher prevalence of suicidal thoughts, plans, and attempts during their lifetime. However, no significant differences emerged between the genders for past-year suicidal behaviors. Males reported using violent methods of attempt such as hanging or shooting significantly more, whereas females were more likely to use nonviolent methods of attempt such as overdose. Of note, cutting and stabbing emerged as the common method endorsed across genders. Results from this study also indicate that a greater percentage of the sample had attempted suicide in their lifetime than had engaged in suicidal ideation or planning. LeMaster et al. (in line with May, 1987) suggest that such paradoxical results provide evidence for conceptualizing suicide attempts as impulsive acts more so than previously theorized within the suicide risk continuum model (in which ideation is suggested as a preliminary behavior to a suicide attempt). In this study, American Indians were also less likely to disclose their intent to commit suicide to others, with interesting age trends emerging in disclosure preferences. More specifically, those aged 25 and above were more likely to confide in a family member, and 15- to 24-year-olds were more likely to confide in their friends.

The epidemiology of indigenous suicidality is additionally complicated when one considers that the majority of investigations of suicidal behaviors within AI/AN communities draw upon reservation or near-reservation based samples, thereby excluding urban populations. In one of the first empirical inquiries of its kind, Freedenthal and Stiffman (2004) examined the prevalence and correlates of suicidal behaviors for urban-reared or reservation-reared American Indian adolescents from a Southwestern state. Results revealed that those having spent two thirds of their life within an urban setting (urban-reared) endorsed significantly lower rates of suicidal ideation than those having spent two thirds of their life on a reservation (reservation-reared). Despite the difference in suicidal ideation, equal rates of lifetime attempted suicide were found.

This discussion of suicide ideation is further convoluted by the regional heterogeneity of suicide death rates and the documented

tribal variation in suicide ideation. In a provocative article exploring factors correlated with suicide ideation among American Indian adolescents from three distinct tribes, Novins, Beals, Roberts, and Manson (1999) found that local culture does indeed matter. They suggested that the range of factors associated with suicide ideation is reflective of the cultural heterogeneity among the tribal groups. Although no significant differences in prevalence of suicide ideation emerged among the three tribal groups, the results that emerged have important implications for thinking about risk factors. The findings and implications of this study will be examined in a subsequent section.

There are several limitations to the demographic information presented above. First, the data regarding prevalence of suicide completion and suicidal behaviors is overwhelmingly biased to reservation-based samples, as few studies have investigated suicidality in AI/AN individuals living in urban settings. The samples studied are also predominantly from school-based settings, thereby excluding the frequently absent and those having dropped out of school, presumably the populations most at-risk. Second, a dearth of research exists concerning the prevalence of specific suicidal behaviors such as suicide attempts in AI/AN communities, and even fewer studies have been aimed at examining nuances in suicidality as related to tribal heterogeneity. Last, reports on the epidemiology of suicide in AI/ANs are typically limited by potential and frequent misclassification of race and ethnicity on death certificates. Instances of misclassification are estimated to range from 1% to 30% depending on IHS region (Indian Health Service, 1996, in Centers for Disease Control, 2003). Limitations aside, the prevalence of suicide and related behaviors in Indian country is overwhelmingly high and undeniably problematic. Although many more questions about the epidemiology of indigenous suicidality remain unanswered, the overarching need for concentrated efforts to prevent suicide is evident.

A Transactional-Ecological Framework for Understanding Suicidality

From a developmental perspective, an examination of risk and protective factors at the biological, psychological, and social

levels of analysis becomes central to any prevention venture. Understanding trajectories leading to intermediate negative outcomes (whether biological, psychological, or social) that ultimately heighten suicide risk is the cornerstone of suicide intervention models targeting pathways to dysfunction. Borrowing from the transactional–ecological framework formulated by Felner and Felner (1989) for prevention efforts in educational contexts, what follows is an elaboration of two selected postulates that are useful when attempting to understand and contextualize suicidality and suicide prevention. The selected postulates are paraphrased from Felner and Felner (pp. 20–22):

1. Disorder results from deviations in normal developmental pathways and processes. The central objective of prevention programs is to hamper such deviations and reinstate more typical, normative pathways.
2. Roots of pathology can be and often are outside the person. A transactional–ecological approach to intervention emphasizes prevention of broad-based antecedent factors and processes rather than targeted disorders.

In this conceptual framework, elevated suicide risk zones are one result of deviations in normative developmental trajectories that lead to negative outcomes. The aim of prevention programs is thus to restore the individual to normative and developmentally appropriate trajectories without "blaming the victim" in the process. As a result, only those biological, psychological, and social risk factors that can be addressed in transactional terms are targeted for preventive interventions. Keeping these two postulates in mind, the role of developmental pathways and the interaction between individuals and their contexts is at the core of understanding suicidality. Within this transactional–ecological approach, identifying antecedent conditions that predispose individuals to generic distress and dysfunction is necessary. Examples of broad-based antecedent conditions could include genetic predispositions to psychiatric disorders like family history of psychopathology, presence of multiple psychological stressors, and societal conditions like poverty, though a transactional–ecological approach would remain less interested in intrapersonal factors as such. A transactional–ecological framework for preventive interventions

underscores the importance of addressing the interactions between individuals and their contexts. Reinstating normative trajectories (rather than treating individual disorders) is then the first line of defense against dysfunction and pathology.

The points of intervention within this framework are determined by the mechanisms and processes leading to impairment and improvement, rather than unpredictable end-states. As a result, intervening in suicidality is conceptualized within a broad-based "antecedent conditions" prevention model, where in contrast to the specific disease model, the individual is understood and treated as inseparable from his or her environment. In general, models of intervention might be crafted along a transactional continuum targeting either the individual (through "person-focused" interventions, such as enhancing coping skills of youth with heightened genetic risk for clinical depression), the transaction of the individual and the environment (through "transaction-focused" interventions, such as enhancing assertiveness skills for women entering a male-dominated profession), or the environment (through "environmentally focused" interventions, such as eradicating impoverished living conditions) respectively. Strictly-speaking, however, the transactional–ecological approach to prevention avoids person-focused interventions altogether, emphasizing transaction-focused and even environmentally focused interventions. Nevertheless, to intervene in lessening suicide risk, leading suicide scholars (in particular, Rudd et al., 2000) espouse devoting comprehensive attention to the risk and protective factors within a biopsychosocial frame of reference that place individuals within or outside suicide risk zones. Hence, suicide intervention models must also devote considerable attention to the factors correlated with both the presence and absence of suicidality. Although a lengthy review of the principles inherent to a transactional–ecological model that could be used to guide and evaluate suicide prevention programs will not be explored in this article, readers are encouraged to consult Felner and Felner (1989) for more detail.

Offered below is a concise description of the relevant risk factors within a biopsychosocial frame of reference with special relevance for Native American communities (readers are again encouraged to view Olson & Wahab, 2006, and Strickland, 1997, for more extensive reviews of identified risk factors for AI/AN communities). Although a transactional ecological framework

places less emphasis on addressing risk factors at the intrapersonal level, a review of the biological, psychological, and social risk factors is essential for a comprehensive understanding of suicidality in indigenous communities. Less attention will be accorded to intrapersonal risk factors, however, such as those functioning at the biological level of analysis (and in some cases at the psychological level of analysis as well).

Risk Factors within a Biopsychosocial Frame of Reference

At the Biological Level of Analysis

Serotonergic hypofunction has been implicated in suicide since the late 20th century. A surge of studies continue to examine the role of serotonin in anxiety and depressive disorders, with growing attention devoted to the role of serotonin in antisocial and impulsive behaviors. In one study published by Zhou and colleagues (2005), the genetic linkages between tryptophan hydroxylase 2 (TPH2), an enzyme involved in the biosynthesis of serotonin within the brain, was examined in four diverse ethnic community samples: Finnish Whites, American Whites, African Americans, and Southwestern American Indians, respectively. Notably, results from this investigation point to significant differences between the ethnic group samples in the allele frequencies of specified markers. In particular, no individual single markers or TPH2 linkages associated with anxious/depressive or suicidal behaviors were found in the Southwestern American Indian samples (in contrast to the other three ethnic groups). In addition, the yang haplotype (identified as a protective factor within the other samples) was absent in the Southwestern American Indian sample. Before interpretations of the intriguing findings of the Zhou et al. study can be made however, a cautionary note is in order. Given the nascent field of bioengineering, stating implications about the consequences of the presence or absence of particular genes or genetic linkages is premature. Above all, the findings of the aforementioned study highlight the need for further specialized research that examines the interplay between genetic predispositions, general antecedent conditions, and environmental contexts in ethnic group populations.

At the Psychological Level of Analysis

Considerable research has been devoted to the study of psychological risk factors predisposing individuals to heightened suicide risk zones. The psychological risk factors for suicidality have been found to be generally similar across populations and broadly include comorbidity with psychiatric and substance use disorders, family and personal history of suicidality, history of abuse (sexual and/or physical abuse), general distress, and interpersonal conflict.

Numerous studies examining suicidality in AI/ANs highlight the associations between depression, hopelessness, PTSD, substance abuse/dependence, and violent ideation/aggression and lifetime history of suicide attempt and suicide ideation, with suicide attempters reporting higher levels of depressive symptomatology and global distress (see Borowsky, Resnick, Ireland, & Blum, 1999; Dinges & Duong-Tran, 1994; Howard-Pitney, LaFromboise, Basil, September, & Johnson, 1992; LeMaster et al., 2004, for thorough reviews). History of attempted suicide has also been associated with higher endorsement of somatic symptoms such as headaches and stomach problems, generalized health concerns, history of sexual or physical abuse, familial history of suicide, and frequent alcohol or marijuana use (Bohn, 2003; Borowsky et al., 1999). For adolescent youth, having attempted suicide has also been associated with greater reporting of unintentional injury and violence, sexually risky activities, tobacco, alcohol and other drug use (Shaughnessy, Doshi, & Everett Jones, 2004). Borowsky et al. also found noteworthy differences in the risk factors for adolescent males and females. Participation in a gang and a history of psychiatric treatment were associated with past suicide attempts in males, whereas knowing where to access a firearm and attendance in special education classes were associated with suicide attempts in females. In this same study, the strongest risk factor associated with a history of attempted suicide among both male and female respondents was having a friend or peer attempt or complete suicide.

Further differences have been found between genders in relation to alcohol use prior to completed suicides. Alcohol-involved suicides have emerged as more prevalent in males, and overwhelmingly high blood alcohol content levels were found in all three American Indian tribal groups examined (May et al., 2002). Moreover in May et al.'s study, alcohol involvement in completed suicides did not distribute

along any age or regional trends and was not associated with any particular method of suicide or residential setting (living on or off reservation). Intimate partner violence and interpersonal conflict are also important risk factors for women, particularly for young adult females (Olson et al., 1999). Interesting age trends within suicide attempter profiles were also found. Specifically, significant differences between adolescents and adults emerged in reported number of attempts, time of attempt, behavior at time of admission to hospital, types of stressors prior to attempt, and rated motivation at time of attempt (Zitzow & Desjarlait, 1994).

Freedenthal and Stiffman (2004) found intriguing differences concerning psychological risk factors for urban versus reservation based samples of AI/ANs. History of physical abuse, a friend attempting or completing suicide, and family history of suicidality were associated with history of attempted suicide in the urban-reared sample, whereas depression, conduct disorder, cigarette smoking, family history of substance abuse, and perceived discrimination were correlated with history of attempted suicide only within the reservation-reared sample. Although few studies, with the exception of that by Freedenthal and Stiffman, have examined perceived discrimination as it relates to suicidal behaviors, racism and general stress have been previously referenced as risk factors in suicidal behaviors for AI/ANs (Johnson, 1994).

Considering the abundant tribal diversity characteristic of AI/ANs, the influence of tribal culture on suicidality must not be overlooked. In Novins et al. (1999) the heterogeneity of psychological risk factors associated with suicidal ideation was explored in a Southwest, Northern Plains, and Pueblo tribe. Distinct tribal variations emerged in relation to risk factors. For example, a friend attempting or completing suicide in the past 6 months, lower perceived social support, and depressive symptomatology were correlated with history of suicide ideation in the Pueblo tribe. Furthermore, single-parent households and higher prevalence of reported life events within the past 6 months was linked to suicidal ideation in the Southwest tribe. Finally, low self-esteem in addition to greater endorsement of depressive symptoms was associated with suicide ideation in the Northern Plains tribe. Interesting gender by culture interactions also emerged such that for the matrilineal Southwest tribe, a more externalized locus of control was associated with suicide ideation in females but not males. This

finding highlights the role of tribal configurations and gender roles in the experience of suicidality.

At the Social Level of Analysis

Developmental models that focus on the interactions between individuals in particular contexts acknowledge broader sociological risk factors. Thus, given the historical context of current-day post-colonial relations between AI/ANs and the federal government, recognizing the influence of historical context on contemporary conditions is essential to identifying social risk factors pertinent to AI/AN communities.

The legacy of colonization (referred to as historical trauma, soul wound, intergenerational trauma, historical legacy, American Indian holocaust, and historical unresolved grief) has been offered as a paradigm for understanding and explaining the alarming prevalence rates of mental disorders and social problems—with much attention devoted to its role in suicide—that have beleaguered AI/AN populations for generations both past and present (Duran, Duran, & Yellow Horse–Brave Heart, 1998; Pole, Gone, & Kulkarni, in press; Yellow Horse–Brave Heart & DeBruyn 1998). The "clash between cultures" or the psychological sequelae and global distress resulting from the acculturation process that has affected tribal structure, religious practices, and personal and community identity, to name but a few domains, has been suggested as a potent precursor to suicidality and psychiatric conditions in general (Echohawk, 1997; Gone, 2006a, 2006b, 2006c, in press b; Kirmayer, Brass, & Tait, 2000; Lester, 1997). Moreover, the legacy of colonization has been thought to affect the AI/AN psyche through a "colonization of the life world" wherein colonizers impeded and disrupted the mechanisms facilitating the reproduction of Native cultural and social practices (Duran et al., 1998). This rupture and disintegration of AI/AN daily lifeways (conceptualized as cultural discontinuity) is proposed as a mediating mechanism in pathways to pathology, and therefore key to transformations of individual and collective identity (Gone, 1999, 2006b, 2006c, in press a, in press b; Gone, Miller, & Rappaport, 1999; Kirmayer et al., 2000).

It is these same transformations in personal and community identity that have received the attention of a handful of researchers

interested in the interplay between AI/AN identity and suicidality. Heightened risk of suicidal behaviors in adolescence has been attributed to failed attempts to make identity-preserving linkages between the past, present, and future. Thus, failure to identify instances of personal-persistence or self-continuity by adolescents was found to be associated with suicidality (Chandler & Lalonde, 1998; Chandler, Lalonde, Sokol, & Hallet, 2003). Chandler et al. (2003) also found that the ability to identify coherence through time within respondents' life stories served to discriminate suicidal and nonsuicidal adolescent participants. A perceived sense of self-continuity is presumably one of many socially mediated factors that modulate suicidality. For instance, sexual minority status has also been suggested as yet another factor involved in elevated suicide risk zones (Conchran, 2001, in Balsam, Huang, Fieland, Simoni, & Walters, 2004). Results indicate that two-spirit people endorse higher rates of childhood physical abuse, historical trauma, anxiety, depression and PTSD symptoms (with reported greater severity) in comparison to their heterosexual Native counterparts (Balsam et al., 2004). These experiences have been previously identified as risk factors for elevated suicidality. It is thus unsurprising that two-spirit participants report significantly more suicide attempts and suicidal ideation (Barney, 2003).

On a more "macro" level of analysis, socioeconomic conditions such as unemployment, and lack of social capital, as well as ecological conditions such as poverty have been proposed as predisposing risk factors for negative mental health outcomes. Settings characterized by lower socioeconomic status conditions and rural areas have been found to be associated with suicidality in AI/ANs (Lester, 1995; Mignone & O'Neil, 2005). Moreover, mounting evidence has called into question the influence of regional and clustering trends on suicidal behaviors. Results indicate that research targeting suicide prevention in AI/AN communities should explore the local cultures of the specific tribal group in addition to the milieu shared with non-indigenous communities (Wissow, Walkup, Barlow, Reid, & Kane, 2001).

Summary of Biopsychosocial Factors

This review of the biological, psychological, and social risk factors for suicide in Native American communities demonstrates that the

factors predisposing indigenous persons to heightened suicide risk zones are multi-faceted and complex. Single risk factors for suicide are not operating in isolation but are likely interacting with other risk factors at multiple levels of analysis, as is evident by the plethora of studies that continually find a combination of risk factors rather than just one associated with suicidal behaviors. It is this interactive network that culminates in pathways to pathological outcomes and increases the possibility for suicidal behaviors. As demonstrated above, genetic linkages, psychiatric conditions, Native identity, social support networks, attitudes toward education, cultural continuity, spirituality, and socioeconomic factors (to list a few) have been found to be correlated with suicidality in AI/ANs. Therefore, the multi-factorial nature of suicide risk along with the continual interactions between individuals and their contexts further underscore the value of a transactional–ecological framework for understanding suicidality in Native American communities.

Points of Intervention within a Transactional–Ecological Framework

In a transactional–ecological model, prevention programs vary regarding the designated points of intervention and the targeted risk factors. Up until now, this discussion has centered on identifying the relevant risk factors (biological, psychological, and social) as indicated or suggested in the literature, with practically no attention devoted to examining the protective factors that buffer AI/ANs from engaging in suicidal behaviors. Equally important to knowing the factors leading to heightened suicidality is the formulation of a deeper understanding of the agents as well as the intervention strategies that have aided in preventing suicide among Native peoples. To actively overcome suicide, interventions must establish and reinforce these protective factors.

Protective Factors

Spirituality has been continually suggested as a potential buffer against suicidality for indigenous peoples. A recent study by Garoutte and colleagues (2003) indicates that a commitment to spirituality in the form of high endorsement of cultural spiritual

orientations is associated with a decrease in the number of reported suicide attempts. Although a protective association between suicidal behaviors and spirituality has been found, the results are inconclusive regarding the protective effect of indigenous identity (loosely construed) on suicidality. Mixed results concerning the association between connection and engagement with indigenous cultural practices and suicidality have been documented (Dexheimer-Pharris, Resnick, & Blum, 1997; Freedenthal & Stiffman, 2004; Howard-Pitney et al., 1992). Moreover, perceived strong family connectedness, social support, and affective relationships with tribal leaders, have also been demonstrated to have a protective effect in the reduction of suicidal behaviors (Borowsky et al., 1999; Dexheimer-Pharris et al., 1997; Howard-Pitney et al., 1992). Interestingly, positive attitudes toward education, perceived interpersonal communication skills, as well as habitual discussion of problems with friends or family members, were also correlated with fewer reporting of suicidal behaviors in the aforementioned studies. Notably, the presence of a nurse or clinic in the school setting also emerged as a correlate of decreased suicidal behaviors in adolescent females. The role of protective factors in the reduction of suicide attempts was highlighted by the findings of Borowsky and associates, wherein the addition of protective factors dramatically reduced suicide risk. Increasing the number of protective factors proved more effective at reducing the likelihood of suicide attempts than reducing the quantity of risk factors.

Moving away from examining individual protective factors to community and societal factors, cultural continuity is emerging as a useful construct in understanding AI/AN youth suicide. The presence of cultural continuity was associated with reduced and in some cases non-existent rates of suicide in certain AI/AN communities (Chandler & Lalonde, 1998; Chandler et al., 2003). In these studies cultural continuity was measured by the existence of the following markers: land claims, self-government, police and fire protection services, health services, education, cultural facilities—in essence, attempts to preserve and promote indigenous cultures.

Healing: Moving Beyond Suicide

Although suicide prevention programs targeting AI/AN communities have frequently addressed broad antecedent conditions with

an emphasis on the role of context on the individual, few studies have scrupulously reviewed and evaluated such intervention efforts (see Middlebrook et al., 2001, for a critical review of suicide interventions and recommendations). According to Middlebrook and colleagues, in cases where outcome evaluations have been conducted, the analyses have been far from rigorous, with results described as "impressionistic" and limited, especially when assessing generalizability to other AI/AN communities. Therefore, information about the effectiveness of the implemented suicide prevention strategies in designated communities remains largely unknown. One recent study, however (May et al., 2005), has evaluated the outcome of prevention efforts within a small AI/AN community over a 15-year period. May and associates found a dramatic downward trend in the number and frequency of suicidal attempts and suicidal gestures since the implementation of a community-based intervention model, with rates in suicide completion remaining the same.

The study by May et al. (2005) highlights the importance of acknowledging transactional-ecological influences on seemingly individual acts such as suicide and suicidal behaviors. For the New Mexico tribe in this recent study, the public-health/community-based approach to suicide intervention was effective, and likely remains effective. Emphasis then needs to be placed on establishing research programs committed to developing interventions that examine and treat individuals and communities within a larger transactional-ecological context. In this light, pathology does not reside within the individual, but in the culminating interactions between individual and contexts (stressors, environment, sociocultural factors, etc).

Conclusion

At the outset of this article, Kevin Gover was quoted as urging us to remember that general healing will commence once the issue of suicidality in American Indian and Alaska Native populations is addressed by both indigenous and non-indigenous peoples. Recent outcome evaluations confirm that suicide intervention programs (especially in AI/AN communities) accounting for the transactional–ecological contexts in which suicide prevention occurs are indeed effective. Hence, situating biopsychosocial risk and

protective factors according to Felner and Felner's (1989) transactional–ecological framework is imperative for developing interventions that actually reduce suicide risk zones. A transactional–ecological framework reminds us that risk and protective factors are operating within an interactive network or transactional system, where an individual's potential for suicide is not independently determined by the presence or absence of particular intrapersonal factors (i.e., within a disease model framework) but is instead dependent on the aggregate interactions between broad-based antecedent conditions and individual variables that unfold within specific contexts over time.

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