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Suicidal Ideation, Attempts, and Associated Psychosocial Risk and Protective Factors in American Indian Youth and Young Adults

Karen Manzo

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**Suicidal Ideation, Attempts, and Associated Psychosocial Risk and Protective
Factors in American Indian Youth and Young Adults**

Karen Manzo, MPH

Dissertation submitted
to the School of Public Health
at West Virginia University

In partial fulfillment of the requirements for the degree of

Doctor of Philosophy in
Public Health Sciences

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tribal college

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ABSTRACT

Suicidal Ideation, Attempts, and Associated Psychosocial Risk and Protective Factors in American Indian Youth and Young Adults

Karen Manzo, MPH

Introduction. Research consistently shows that suicidal ideation and attempts are more prevalent among American Indian youth and young adults than youth and young adults in other racial/ethnic groups. Many of the associated psychosocial risk and protective factors are shared across racial/ethnic groups; however, for most of them, the prevalence is highest in American Indian youth. Research on the relation between suicide risk and culturally unique risk (e.g., childhood adversity, discrimination, parenting, unresolved grief, out-of-home placement) and protective factors (e.g., enculturation, cultural values, spirituality) in American Indian youth and young adults is limited. The goal of this research was to examine shared and culturally unique psychosocial risk and protective factors and coping strategies associated with suicide risk in American Indian youth and young adults.

Methods. Three interdependent cross-sectional studies were used to assess risk factors associated with suicidal ideation and attempts in Montana high school students using Youth Risk Behavior Survey (YRBS) data and to test a stress-coping model of suicide risk in American Indian tribal college students. In the first study, logistic regression was used to examine gender-specific individual-level risk factors associated with suicidal ideation/attempts for American Indian and White Montana high school students using pooled *random sample* secondary YRBS data. In the second study, logistic regression was used to identify gender-specific individual-level risk factors associated with suicidal ideation and attempts in American Indian students attending Montana reservation and urban high schools using pooled *volunteer sample* YRBS data. In the third study, logistic regression was used to test a stress-coping model (situated within a cultural-historical context) to determine associations between suicide risk and life stressors, coping skills, enculturation, cultural values, resilience, and social support in American Indian tribal college students in Montana and Wyoming using primary cross-sectional survey data.

Results. The primary results of the first study showed that American Indian youth had significantly more suicidal thoughts and attempts than the White youth. However, within YRBS risk factors, they had fewer statistically significant risk factors compared to the White youth. Sadness/hopelessness was the strongest, and the only statistically significant, risk factor of suicidal ideation/attempts shared across all four groups. The unhealthy weight control cluster was a significant risk factor for the White youth and the American Indian girls; alcohol/tobacco/marijuana use was a significant risk factor only for the American Indian boys. Findings for the second study showed that the prevalence of suicidal ideation and suicide attempts did not differ significantly between reservation and urban American Indian youth. However, regression analyses showed differences and similarities in significant risk factors for ideation and attempts for girls and boys across the locations. Fewer differences were noted for girls than boys. Sadness/hopelessness was the only statistically significant risk factor for suicidal ideation and attempts common for girls and boys in both settings. Some form of violence (partner victimization, lack of school safety) was significantly and positively associated with either ideation and/or attempts in almost all groups. Partner victimization was significantly associated with both ideation and attempts for girls, but was inconsistent for boys. Lack of school safety was significantly associated with suicide attempts across the four groups, but was not a significant risk factor for ideation. Findings from the third study in Montana-Wyoming tribal

college students revealed low levels of past year suicide risk. Culturally unique stressors such as adverse childhood experiences, parenting difficulties, thinking of historical losses, and discrimination were significantly and positively associated with suicide risk. Gratitude, social support, participant boarding school attendance, and higher current income mitigated suicide risk.

Conclusion. Results using the YRBS data show important differences in risk factor categories across the racial/ethnic and reservation-urban groups for girls and boys and indicate directions for future research targeting prevention and intervention. Results from the tribal college setting show important areas for future research and have implications for socioeconomic, structural, familial, and culture-based intervention development. A comprehensive understanding of culturally unique life stressors and cultural buffers is important to inform effective interventions and reduce suicide-related morbidity and mortality in his population.

DEDICATION

This dissertation research is dedicated to Gordon Belcourt, MPH (Blackfeet) and Cheryl Belcourt, BA (Mandan/Hidatsa), former and current Executive Directors for the Rocky Mountain Tribal Leaders Council¹ located in Billings, Montana. Their support made this possible. I am deeply grateful.

¹ Formerly known as the Montana-Wyoming Tribal Leaders Council.

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CHAPTER 1. INTRODUCTION

1.1. Definitions

For the purposes of this dissertation, *suicide* is defined as a death from a self-inflicted act. *Suicidal ideation* is defined as thinking about, considering, or planning for suicide. A *suicide attempt* is defined as a self-inflicted non-fatal act. *Suicidality* or *suicide risk* encompasses any or all of the above terms. *Stressor* is defined as a situation or event self-appraised as being aversive that elicits a physiological or psychological stress response (1). A *traumatic stressor* is an event that comprises actual or threatened death or serious injury, or alternative threats to an individual's well-being, as well as learning about the unexpected or violent death, serious harm, or threat of death or injury of a close associate or family member (2). *Indigenous* refers to any or all of the first peoples who live in the United States, Canada, Australia, or New Zealand. *American Indian* refers to Indigenous people living in the 48 contiguous United States (US). *American Indian/Alaska Native* refers to Indigenous people living in the lower 48 states and Alaska. *First Nations* refers to the Indigenous people of Canada. Different terminology is used to refer to Indigenous peoples in the literature. For the purposes of this dissertation, the term used in a particular study will be used when that study is referenced. The current research uses American Indian to refer to the dissertation research population. However, for brevity, the term *Native* may be used interchangeably with any of the Indigenous terms.

1.2. Conceptual Framework

Suicidality is a complex, universal phenomenon. Since Durkheim's seminal social integration theory (3), many models have been used to understand suicidality, including but not limited to: biomedical models [genetic (4, 5), epigenetic (6-8), neurobiological (9, 10)]; psychological models (11, 12); life course developmental models (13-16); epidemiologic models (17-19); multi-level socioecological models (20-22); and, stress-related models (23-25). Individual level models are limited in that they ignore the social, cultural, and historical context of suicide. Developmental models are important to understand how age, gender, and identity formation affect suicidality (15, 16), but also are limited by their individual-level focus. Socioecological models consider the individual within the context of peers, family, culture, and

society (20), which provides a framework for a more comprehensive understanding of suicidality among Native peoples.

Although Durkheim attributed suicide to social causes, and his suicide categories do not apply equally for men and women, the related, but independent social integration categories are useful for understanding Native suicide. Briefly and pertinent to Native populations, according to Durkheim, *anomic* suicide results from a lack of social regulatory influences wherein life crises disturb the collective order. As an example, how divorce or 'break-ups' may affect life equilibrium, especially in men (26, 27). His *egoistic* category states that suicide results from a lack of social integration. In Native communities, this is reflected in historical events that radically altered the social structure, including assimilation policies, such as mandatory boarding school attendance and urban relocations, as well as the current exorbitantly high rates of unemployment and incarceration in Native communities. This social disintegration has disrupted family relationships and kinship structure, inhibiting the generational transmission of language, traditional parenting skills, and cultural practices and values, thereby weakening the collective conscience deemed important by Durkheim for strong social integration (28, 29).

As a conceptual framework, this dissertation work uses an Indigenist stress-coping model that is situated within a unique socio-cultural, historical context (24, 25, 30-33). Stress-coping models have been used to conceptualize suicide risk in the general population (34, 35). A stress-coping model for suicide risk has not been tested in this population, although a stress-coping model has been conceptualized for Native health overall (24, 25, 36). This framework also incorporates developmental aspects, because coping strategies are often age- and gender- as well as culture-based (37-40). Similarly, a stress-vulnerability model has been used to conceptualize suicidality in several populations (23, 41, 42), including college students (43). However, stress-vulnerability models focus on vulnerabilities only. The Indigenist stress-coping model was selected as a conceptual framework for this research because it focuses on cultural strengths that may serve as stress buffering mechanisms. Focusing on cultural strengths, as opposed to a deficit, risk factor model, is a life- and hope-affirming approach (21, 44). The following presents a comprehensive review of the literature, followed by how gaps in the literature are addressed through the research specific aims.

1.3. Extent of the Problem

Suicide deaths, suicidal ideation, and non-fatal suicide attempts are a worldwide public health problem with extreme heterogeneity between and within countries (29, 45-47). Suicide is

a leading cause of death in the US, with highest rates consistently found in Alaska, Montana, and Wyoming (<http://www.suicidology.org>). Prior to contact with Europeans, suicide was rare in Indigenous communities (48, 49). Many tribal groups had, and still have, explicit cultural beliefs prohibiting suicide (26, 50). Today, however, rates of suicide are two to four times higher among Indigenous peoples worldwide than their national counterparts (51-54). Indigenous suicide rates also vary greatly within and across countries (29, 55-59). In contrast to the general population where suicide deaths occur most often in older adults (60, 61), Indigenous suicide deaths occur most frequently in those under 25 years and are especially high in ages 20-24 years (62, 63). One Southwest tribe reported age-adjusted suicide rates of 40/100,000; however, the rate reported for 20-24 year olds was 152/100,000. These are 4 and 12 times the rates for respective age groups in the US as a whole (62). Compared to non-Native contemporaries, American Indian males 15-19 years of age are two to four times more likely, and American Indian females of that age are 11 times more likely, to commit suicide than corresponding US youth (64); yet these rates are thought to be underestimates. Overall, the rate of suicide is lower among college students than their non-college peers; however, suicide is the second leading cause of death among college students (65-67). Suicide death data are not available for American Indian college students.

Suicide deaths in the US are seriously undercounted and suicide mortality appears vulnerable to differential misclassification according to decedent race/ethnicity (68). The Indian Health Service estimates that American Indians are misrepresented by an average of 11% on state death certificates (69). This racial/ethnic misclassification appears to be most problematic for suicide deaths (70), contributing to a potential underestimation of suicide as a public health problem in this population. American Indians also appear to have a higher rate of undetermined injury deaths than other racial/ethnic groups (71). These data are important for suicide prevention efforts, because research shows a strong link between injuries of undetermined intent and suicide in other minorities (72-74). For example, data show greater potential for the misclassification of suicide as injury deaths of undetermined intent for African Americans than Whites and for females of both racial/ethnic groups (72).

Suicidal ideation and suicide attempts are both significant predictors for risk of a completed suicide (18, 75). Like suicide deaths, suicidal ideation and attempts also vary by gender, age, racial/ethnic group, geographic location, and cultural subgroups. Worldwide, women attempt suicide at least three times more often than men (45). Overall, suicidal ideation and attempts occur most commonly among younger people, whereas suicide deaths occur most commonly among older adults (14, 61). Overall, suicidal ideation and attempts are much higher

among Indigenous youth than youth from other racial/ethnic groups. This is true for the US as well, where suicidal ideation and attempts are significantly higher for American Indian youth ages 15-19 years (especially girls) than other US racial/ethnic groups (76-78).

Among Indigenous youth, several studies have reported prevalence of suicide attempts and a limited number have reported prevalence of suicidal ideation. In the US, a national study found that prevalence estimates for suicidal ideation and suicide attempts, respectively, are highest among American Indian (23.1%; 16.4%) and Hispanic youth (16.5%; 10.1%), and lowest among African American youth (12.3%; 7.8%) (78). Another national study found significantly higher suicidal ideation and suicide attempts for American Indian youth than either Asian, African American, Hispanic, or White youth (79). A study of urban youth showed suicide plans and attempts were two and three times higher for American Indian than White youth (80). Similarly high estimates were noted in two separate nation-wide studies of youth from reservation-based schools, where 22% of the girls and 12% of the boys reported ever attempting suicide (81, 82). Also, a study of schools funded by the Bureau of Indian Affairs reported that 19.3% of girls and 12.2% of boys had ever attempted suicide (83).

Regional and tribal variations also exist. This variation is to be expected because American Indian tribes are culturally heterogeneous (language, kinship structure, gender roles, conceptualization of death) and have different assimilation experiences (84-86). However, Novins and colleagues found no significant difference in past month suicidal ideation among high school youth from three culturally distinct tribal areas (Southwest [2.3%], Northern Plains [5.0%], Pueblo [3.8%]) (86). However, cultural heterogeneity is evident in this study in that none of the statistically significant risk or protective factors for ideation were common across the three tribal areas. In Hawaii, Native Hawaiian youth reported significantly higher suicide attempts (12.6%) than non-Native Hawaiian youth (9.6%) (76). This is also true for Oregon, where American Indian youth (10.5%) reported twice as many past year attempts as White youth (5.3%) (87).

The sparse epidemiological suicide data for American Indian college students show that they report higher suicidal contemplation than college students overall (15% vs. 9.5%) (88, 89). In contrast with the youth and young adults, population-based data show that American Indian adults were significantly less likely to report lifetime suicidal ideation compared to National Comorbidity data (90). However, the same study also reported regional differences in that Northern Plains tribal members were significantly more likely to report lifetime suicide attempts than either Southern Plains tribal members or the general population.

1.4. Psychosocial Risk Factors

Like suicide deaths, suicidal ideation and attempts are complex phenomena with many potentially modifiable psychosocial risk and protective factors (91). Many of these risk factors are shared across racial/ethnic groups; however, the prevalence of most of these risk factors is highest in American Indian youth (78). As with other racial/ethnic groups, American Indian girls report attempting suicide almost twice as often as American Indian boys (82). Research shows a direct relation between gender and suicidal ideation and attempts, as well as various individual-level psychosocial risk factors. Risk factors shared among racial/ethnic groups include: previous suicide attempt (82); poor mental health (11, 82, 92-94); co-morbid psychiatric disorders (11, 95); minority sexual identity/attraction (82, 92, 94, 96-98); exposure to suicide (82, 92, 94, 99); bullying (94, 100); and life stress, such as child physical and sexual abuse (101, 102), intimate partner (103) and dating violence (97, 104), and sexual assault (87, 105). Each of these factors may be exacerbated by unhealthy coping responses (106), as well as enabling factors such as access to firearms (107-111) and substance use (82, 92, 94, 112, 113). Socio-environmental factors associated with suicidality are also shared across racial/ethnic groups, such as family structure (92, 114), family substance abuse (99, 115), and poverty (11, 116, 117). However, research in other populations indicates that social fragmentation may play a more important role than poverty (28, 117-119).

1.4.1. Psychiatric Disorders

The strongest predictor for suicidality is the presence of psychiatric disorders. In particular, depression consistently shows the strongest independent risk for suicidal ideation and attempts (11, 120-123), especially when comorbid with anxiety or disruptive disorders. One example is the Great Smoky Mountain Study (GSMS). Researchers randomly selected and screened 4500 of the 11,758 American Indian and White youth (aged 9, 11, and 13) in 11 counties in the southeastern US for psychiatric symptoms. Data from the GSMS reveal strong significant associations for suicidality and depression (OR = 21.7) and depression comorbid with general anxiety disorder (OR = 50.2) or disruptive behavior disorder (OR = 5.8), even after controlling for age, gender, race, poverty, and number of psychiatric symptoms (11). In contrast, associations with suicidality and substance abuse have been mixed across studies (11, 124). Interestingly, the GSMS showed an inverse association for illicit drug use, and no significant association with alcohol use, and suicidality (11), while other studies with youth have shown an association between alcohol and suicide attempts. For example, a study of Navajo youth found

an association between weekly hard liquor use (OR = 2.7) and suicide attempts, after adjusting for age, gender, child physical/sexual abuse, exposure to suicide, mental health, and other substances (124). The researchers also noted a linear trend for frequency of hard liquor use and increasing prevalence of suicide attempts.

1.4.2. Traumatic Experiences

Suicide risk also is associated with experiencing adversity as a child, especially cumulative adversity (125). Childhood adversity is associated with many adverse health and social outcomes, including suicide-related risk factors such as depression (126), intimate partner violence (127), and substance abuse (128-131). The Adverse Childhood Experiences (ACE) Study examined associations between potential adverse experiences (emotional, physical, and sexual abuse; battered mother; household substance abuse and mental illness; parental separation or divorce; and, household member incarceration) that occurred during the first 18 years of the participant's life and various health outcomes in adulthood (132). The associations were strong and often showed a linear relation with cumulative adversity. Those reporting any individual ACE were two to five times more likely to attempt suicide than those reporting no ACE, even after adjusting for age, gender, race, and education. The risk for attempting suicide increased substantially with an increasingly higher number of reported ACE. In addition, the linear, exposure-response relation for cumulative adversity was twice as strong in those who attempted suicide during childhood/adolescence as compared to those who attempted suicide in adulthood. This graded relation was consistent across four birth cohorts (133).

A separate study of American Indian adults from seven tribes found significant associations between various ACE and alcohol dependence (134). This study found statistically significant tribal and gender differences in the prevalence of ACE and alcohol abuse/dependence. There were also gender differences in which ACE were significantly associated with alcohol dependence, especially for those reporting multiple experiences. For women, sexual abuse and boarding school attendance were significantly associated with alcohol dependence, while experiencing both physical and sexual assault as a child was significantly associated with alcohol dependence in men. Childhood adversity has also been linked to early initiation of substance use in Native youth (135), who may not have had time to develop effective coping strategies, such as problem solving skills. Although severe childhood adversity can negatively affect psychosocial development, the effects can be mitigated by

having a close bond with an effective parent, parental surrogate, or mentor, such as a teacher or other community member (136).

Acute and chronic stressors are pervasive in the lives of American Indians who are exposed to an exorbitant number and type of traumatic experience over the life course. The American Indian Services, Utilization, Psychiatric Epidemiology, Risk and Protective Factors Project (AI-SUPERPFP) was the first large, population-based, socio-psychiatric epidemiology study in American Indians from two culturally distinct tribal areas (Northern Plains, Southwest) (137). Their socio-epidemiological analysis of trauma revealed differences and similarities between the Southwest and Northern Plains tribal areas (138). For example, trauma prevalence differed by type of trauma, tribal area, and gender; however, exposure to suicide was similar for men and women from both tribal areas. As would be expected, women of both tribal areas reported significantly more interpersonal trauma, rape, molestation, and intimate partner violence than men. Men of both tribal areas reported a significantly higher prevalence of non-sexual physical attacks. Those with higher education levels were significantly more likely to experience or be exposed to trauma for either tribal area. Living in poverty showed a significant inverse association with some trauma categories, but for the Southwest tribal area only. Because this is contrary to the general trauma literature (139), minority stressors may be a factor. Research has also shown that higher education levels, while protective against suicide in White men, increased the risk of suicide for African American men (140). Further research is needed to determine which factors play a role in this racial/ethnic inconsistency. For example, perceived discrimination, level of cultural integration, or cultural identity may play a role. Studies also have shown a link between traumatic experiences and substance abuse for youth and adults (141-144).

The AI-SUPERPFP group also examined associations between psychiatric disorders and suicidal behaviors (Northern Plains tribal area only) (121). Consistent with the literature, women and young adults reported significantly higher suicidal behaviors. Female gender, depressive disorder, posttraumatic stress disorder (PTSD), substance abuse/dependence, and violent ideation/aggression were significantly associated with both suicidal ideation and attempts. After adjustment for the other variables, depressive disorder (OR = 5.5) and violent ideation/aggression (OR=4.3) showed the strongest association with suicidal ideation; suicide attempts were more likely among those reporting depressive disorder (OR = 3.7) or PTSD (OR = 2.9). In a second suicide study, this group compared the association of mental disorders and traumatic events with suicidal ideation and attempts in two tribal areas with a general population-based sample (90). Data showed similar significant risk factors across the three

groups with minor exceptions. There was a significantly stronger association between ideation and being in an accident or experiencing other unexpected trauma, and a significantly lower association between attempts and anxiety disorders in the Northern Plains group compared to the other two groups.

1.4.3. Discrimination

Discrimination is a multifaceted, pervasive minority life stressor (145, 146). It has been linked to multiple physical, mental, and social health consequences (147-151), including poor mental health (150, 152-163), suicidal ideation and attempts (113, 164-166), substance abuse (151, 162, 167, 168), and unmet health care needs (169-171). Discrimination appears to affect men more than women (172). A limited number of studies have examined the effects of discrimination on Indigenous health. Among Native Hawaiians, high perceived discrimination and identification with mainstream culture were independently associated with hypertension (147). Associations were found between discrimination and poor mental health outcomes in Australian Aborigines (173). Similarly, discrimination has been associated with bullying and poor health in Norwegian Sami (174, 175). Discrimination has been recognized as a risk factor for suicidality in minorities for some time (164-166), including American Indians (113, 176); however, the research in American Indian populations is limited and shows conflicting results. One study, using a 10-item measure of discrimination, found a significant association between perceived discrimination and suicidal ideation in reservation youth controlling for gender, enculturation, negative life events, self-esteem, and substance use (113). In contrast, two studies using a single-item measure of perceived discrimination found no significant association with suicidality in American Indian youth (82, 99).

Discrimination also has been linked to substance use in youth and adults (167, 168), especially in boys, where the data show discrimination leads to increased use of substances over time (167). It also has been linked with substance abuse in Native youth (177, 178). As with childhood adversity, discrimination is associated with early initiation in substances in Native youth (177). Youth may not be developmentally capable of choosing more effective coping strategies or they may not have access to them (178, 179). Participation in traditional activities (180), healthy coping responses (181, 182), and high self-esteem (183) appear to lessen the negative health effects related to discrimination.

1.5. Psychosocial Risk Factors Unique to American Indians

Governmental policies which have adversely affected the health and well-being of Indigenous people worldwide provide the socio-historical context to frame these experiences. This is frequently referred to as *historical* or *intergenerational trauma* (30, 184-186). The concept of historical trauma is commonly described as a *soul wound* or as unresolved grief that is thought to manifest as physical, psychic, and spiritual suffering, the effects and reenactment of which are believed to be transmitted from generation to generation (30, 32, 187). It characterizes the accumulated and collective suffering, loss of a way of life, and cultural oppression that spans generations and includes many human rights violations. Examples of historical trauma include forced removals, horrendous living conditions with inadequate and insufficient food, forced acculturation, forced sterilizations; banning of religious practices and languages; boarding school abuses and deaths; disproportionate foster care placement; disrupted family and cultural attachments and identity; and present day racism and discrimination (30-32, 36, 83, 178, 188-192). All of these are believed to contribute to contemporary American Indian health disparities. The bulk of the historical trauma research has been conducted among Jewish Holocaust survivors and their children (193-199); however, empirical research is beginning to operationalize historical trauma among American Indians (105, 178, 200).

1.5.1. Assimilation Period

In the early history of the US, tribal nation status went from full sovereignty to constitutionally defined “domestic dependent nations (201).” Policies established during the Assimilation Period (1887-1953) were deliberate and concentrated efforts to impose individualistic and Christian values on American Indians (202); less stringent efforts were made prior to this period, for example, through the Civilization Fund Act of 1819 (185). The federally funded church- and government-run boarding school system was a unique aspect of assimilation policy. The boarding school era is an especially disturbing part of American Indian history because it separated Native children from their families and culture and placed them in sometimes unspeakably abusive conditions (203). Actions ranged from misplaced benevolence by White women wanting to provide “proper” child care and education for the Native children (204), to acts that today could be classified as genocide by the standards of the 1948 Genocide Convention (202, 205). Specifically, Article 2 of the Convention describes genocide as acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious

group, including . . . *forcibly transferring children of the group to another group*. This was epitomized by the ideological foundation of boarding school originator, Richard Pratt (former prisoner of war warden): *Kill the Indian, and save the man* (206).

In the 1870s, as slavery ended and African Americans and new waves of immigrants were being assimilated into American society, the US government instituted off-reservation boarding schools for the express purpose of culturally assimilating American Indian children. Placed in schools that were often intentionally far from their home reservations, the children were forced to deny their tribal identity, culture, traditional practices, and language, which they were punished for speaking, at times severely. Also during this time period, traditional ceremonies were banned and assimilation policies forced Christian religion and ideals on Native populations. This was reinforced in the boarding schools through military-style discipline. For example, children lived in prison-like settings, wore uniforms, and were required to march throughout the day. As punishment, they could be imprisoned in the guardhouse, placed in isolation, deprived of food, or forced to run the “belt-line,” a line of whippings often led by fellow students (206, 207).

Some parents wanted their children to have an education and willingly entrusted their children to the care of school personnel. However, many parents were coerced into sending their children, and many children were traumatically separated from their families, causing a burgeoning distrust of the conditions at the schools. In extreme cases, children were stolen, hog-tied, or put in cages to be transported to the schools (208). Due to mounting distrust, many parents hid their children to protect them, went without rations, or went to jail for refusing to allow their children to attend (209). Many students rebelled by running away from the schools, setting fires, conducting clandestine ceremonies, and engaging in passive resistance. The results of the unsanitary, disease-ridden, and overcrowded conditions and malnourishment led to many deaths. Medical care and conditions were so poor that each school had a graveyard (210, 211). The schools were understaffed, primarily by single Christian women who were themselves separated from their families. The teachers were underpaid and unaccredited. Children were segregated by age and gender. Many of the young children who required more care did not receive adequate attention. Many siblings had little contact with each other. Symbolically laden changes occurred upon entering the boarding school. The children’s hair was cut (a symbol of grief for many tribes), their names were changed or they were given a number, and at times, their traditional clothes were destroyed (209).

The children at the boarding schools suffered intellectual, cultural, emotional, physical, and sexual abuse at the hands of staff, clergy, and older children. Their education was

rudimentary and manual labor-focused, often teaching menial skills that were not useful for reservation life or for securing employment once they left the boarding schools (206). The emphasis for boys was farming and manual labor, at times coffin making for children who had died. The emphasis for girls was domestic service and Victorian moral standards (206). Because the schools were severely underfunded, child labor built and furnished many schools. The children labored in gardens and dairies, in many cases having no access to the food produced. The “outing program” was another source of unpaid child labor. Rather than send the children home during the summers where they would be exposed to their families, language, and traditions, children were involuntarily sent to live with and labor for White families during the summer months (209, 212). The boarding school movement occurred during a time when the US was only beginning to institute compulsory education laws (185). Ostensibly, requiring the average American child to attend school protected them from child labor exploitation that was common in the US until the institution of the Fair Labor Standards Act in 1938. In reality, in the case of the average Native child, compulsory education and child labor often went hand-in-hand.

1.5.2. Reorganization Period

Periods of policy reform began after the 1928 Meriam Report (211); however, few changes were enforced. Published four years after the Indian Citizenship (Snyder) Act of 1924 (185), the report strongly criticized the boarding school system and brought the “grossly inadequate” boarding school conditions to light. Some of the recommended changes included improving the children’s diet, decreasing the heavy work-load, and increasing the number of on-reservation public day schools. The Meriam Report also suggested improving the crowded conditions by keeping children at home until adolescence to not harm the children’s development by taking them from their parents at a young age. Although the assimilation period officially ended with the enactment of the 1934 Indian Reorganization Act (the *Indian New Deal*), World War II interrupted changes from taking place (213). During this time period, more emphasis was placed on reservation, than off-reservation, boarding schools. After the Termination Act of 1953, the government encouraged public school attendance; however, 93 boarding schools were still in operation (214). At this time, 51,000 (26%) American Indian children attend boarding schools as opposed to 80% of American Indian children circa 1900 (215). In some cases, boarding schools became the norm with parents and communities expecting that the children would attend the “Indian schools,” instead of the “White” public schools (208, 214, 216).

Forty years after the Meriam Report, the 1969 Kennedy Report *Indian Education: A National Tragedy: A National Challenge* found similar failures with the boarding schools, including inadequate funding, deficient education, and a rigid, impersonal environment (217). Discriminatory practices continued into the 1960s, where students at one Montana reservation boarding school were segregated by blood quantum, (i.e., skin color; personal communication), illustrating on-going assimilationist attitudes. Although limited in number, there have been a few success stories, as well. For example, Jim Thorpe excelled in sports, and Charles Alexander Eastman, MD and Gertrude Simmons Bonnin were two of many who used their boarding school education to advocate for American Indian civil rights (212).

1.5.3. Self-Determination Period

After the institution of the Indian Self-Determination and Education Acts of the 1970s and the Indian Child Protection Act of 1990, tribes were able to assume more responsibility for their children's education, including stringent background checks for teachers and staff. At present, boarding schools are no longer mandatory; however, many American Indian children still receive their education in boarding schools. Although most American Indian children currently attend public day schools about 17,000 currently attend boarding schools (218), which can be a protective environment for many at-risk youth (77). Many now feel an attachment to and ownership of the "Indian" schools. Reasons for attending contemporary boarding schools include remote home locations, concerns with discrimination at local schools, youth in crisis, delinquent behavior, and to escape abusive home environments (77, 208, 212, 219).

During this time period, tribes also began establishing tribal colleges. The Tribally Controlled Community College Assistance Act of 1978 and the Higher Education Act affirmed the inherent right of tribes to educate their citizens (220). To be accredited, tribal colleges follow the principles of the Association of Governing Boards. However, tribal colleges are unique in that they also promote the development of cultural integrity, identity, and traditional values through courses in American Indian studies, tribal government and law, tribal history and languages, and traditional arts, spirituality, and medicine. There are currently 36 accredited tribal colleges nation-wide with approximately 20,000 students (221).

1.5.4. Out-of Home Placement

As boarding school placements were lessening, a disproportionate number of American Indian children were being placed in foster care or adopted out, usually with non-Native families. During the 1960s, American Indian children in Montana were 13 times more likely to be placed

in foster care than non-American Indian children in the state (208). Traditional child rearing practices and kinship networks were misunderstood and judged as “permissive” and inferior to White middle-class values. A combination of discriminatory standards, “drunken Indian” stereotypes, due process violations, parents not understanding their legal rights, and monetary incentives for foster parents continued the disruption of families for 25-35% of American Indian children during the 1960s and 1970s (208, 222). This is in comparison to 0.5% of US children overall.

The Indian Child Welfare Act of 1978 established minimum standards and safeguards to protect the best interests of the American Indian children (222). Application of the federal law varies across states (223, 224), several of which have created an “existing Indian family” exception that allows state courts to decide the ethnic identity of a mixed race child (225). Currently, more than 10,000 American Indian/Alaska Native children are in foster care across the US (226). Nationwide, American Indian/Alaska Native children are more than twice as represented in foster care as children in the general population (227); the disproportion is greater for Northern Plains states where the number of Native children in foster care can be three to four times higher than in the general population of their respective state. For example, although Native children represent 10% of the child population of Montana, they represent 33.6% of the children placed in foster care in that state. This disproportion has remained constant since 2000 (227).

1.5.5. Empirical Research to Date

There is a paucity of research or theory related to the impact of boarding schools, whether among the privileged, or among American Indians (228). Even when socially accepted, boarding school attendance can be traumatizing for any child, especially children who leave their primary caretaker during the latency developmental stage, around age 5 to adolescence. From clinical observation, Schaverien has proposed a *Boarding School Syndrome* to describe the “cluster of learned behaviors and discontents” resulting in disrupted parent and sibling relationships and intimacy problems (228). She suggested these losses result from early childhood boarding school attendance and homesickness, and the bullying and sexual abuse that take place in the schools. American Indian boarding schools and the traumas and life stress associated with the federal boarding school system and out-of-home placement are ubiquitous in the lives of American Indians and pose unique health risks compared to other racial/ethnic groups in the US.

Baseline data from a Canadian First Nations longitudinal health survey illustrate the damaging health effects of boarding school attendance (229). About 18% of attendees reported lifetime suicide attempts. Although this was not significantly different from non-attendees, there appear to be generational effects. For example, adults (ages 18+) who had *at least one parent* attend boarding school reported significantly more suicidal ideation (37% vs. 26%) than adults whose parents did not attend a boarding school. Significantly more suicide attempts (20% vs. 13%) were reported among adults whose *grandparents* attended boarding school compared to those whose grandparents did not attend. Youth (ages 12-17) whose *parents or grandparents* attended also were more likely to report suicidal ideation/attempts than youth of non-attendees, illustrating the potentially negative generational effects of the boarding school system. Additionally, many of the attendees reported experiences that are associated with suicidal ideation and attempts, including witnessing the abuse of others (71.5%), being sexually (32.6%) or physically (79.2%) abused, or being bullied (61.5%). Research shows a significant inverse association between boarding school attendance and self-perceived health, even after adjusting for education and employment, which were both positively associated with self-perceived health (230).

Significantly more experience with interpersonal trauma (direct or witnessed) was reported among US boarding school attendees, as well (141). Gender differences are evident. Results from one study showed that men attendees reported having experienced more physical and sexual abuse and punishment for speaking their language than did women attendees (231). Data from another study show that boarding school attendance was associated with alcohol dependence in American Indian women, but not American Indian men (134). A study of general and culturally relevant stressors showed a significant association between boarding school attendance and depressive symptoms after adjusting for childhood adversity and thinking about historical losses, but not negative adult life events (232).

A cohort of youth and young adults who had at least one parent who attended boarding school reported significantly more sexual assaults and suicide attempts than those whose parents were non-attendees (49, 105). In addition, a recent study of First Nations adults found a significant association between boarding school attendance and being abused, but not suicidal thoughts or attempts (233); however, attendees who had a history of abuse were significantly more likely to have reported suicidal thoughts or attempts. Having a parent or grandparent attend boarding school was significantly associated with a history of abuse, suicidal thoughts, and attempts for First Nations adults who did not attend boarding school themselves, although

there were no significant generational associations for participants who had themselves attended boarding school.

Foster care placement and adoption also can adversely affect health. In the general population, research shows a significant, positive association between foster care placement and depressive symptoms and suicidal ideation, particularly for those living in group homes (234). Adoption has similar affects: adoptees are at increased risk for suicide attempts compared to non-adoptees (235). The risk for suicide attempts and completed suicide significantly increases with increasing number of placements (i.e., changes in residence) (236). Research shows that Native youth in foster care are at risk, as well. Similar to parental boarding school attendance, Native youth who were taken from their parents reported significantly more sexual abuse and suicide attempts than those not taken from their parents (49, 105). Research also has shown that Native youth in the child welfare system were 3.7 times more likely to report suicidal ideation (across three time points) than their non-Native counterparts, even after controlling for living arrangement and number of placements (237). Several studies conducted among Native adults have shown that the effect of foster care placement lingers into adulthood. One study conducted among Metis adults (age 20-59 years) found a correlation between history of foster care experience and suicidal ideation, although boarding school attendance was not a significant correlate of ideation (117). A second study among Metis adults (age 25 and up) found a significant association between foster placement and both depression and suicidal ideation (238). Foster care placement also appears to be directly associated with alcohol dependence in American Indian women, but not American Indian men (134). It is possible that this difference may reflect gender-based coping (38, 39).

Removing children from their family has developmental consequences that may be detrimental to forming healthy relationships and cultural identity, the generational transmission of traditions and parenting skills, and mental health (31, 48, 239, 240). These practices undermined parents' rights and the ability of future generations to raise their children in traditional ways, disrupting community-level structures and social order that protected women and children. The physical, emotional, and sexual abuse rampant in Native lives were rare occurrences prior to colonization (241). The removals and abuses culminated in generations of collective silence and unresolved grief from feelings of stigma, shame, inadequacy, and guilt related to the abuses, including student-on-student abuse from identifying with the aggressor or being forced to do it (242, 243), and the boarding school experience in general (31, 203, 244). The legacy of these historical events remains on the minds of many youth and adults (200, 245-

247). Thinking of these losses has been linked with depression and substance use in youth and young adults (178, 246, 248) and depressive symptoms in adults (232).

1.5.6. Parenting and Child-Rearing

Boarding school attendees often are not prepared as parents to care for their children or to have healthy intimate relationships due to traumas during development that have impaired ability for attachment and familial transmission of traditional parenting skills. Being deprived of traditional child-rearing role models (249), many parents have modeled the abusive experiences of the boarding schools and foster homes (31, 229, 240).

Traditional value systems, such as the relational worldview and extended kinship family structure, where parenting and family were at the core, were also disrupted by assimilation practices (216, 250-258). At present, in many cases, the kinship networks have been weakened and family structure changes frequently; fathers and extended family are not always present in their children's lives (257).

Several studies have described parenting among mothers who experienced childhood sexual abuse (259-261), including how trauma and depression impact parenting (101, 262). However, few studies assess how child sexual abuse victimization affects fathers. It is important to understand the generational consequences and mental health impact on all abuse victims. An AI-SUPERPPF study examined the association between childhood sexual abuse and parenting satisfaction and parenting role impairment (101). Although childhood sexual abuse did not have a significant effect on satisfaction, the researchers found a strong association between childhood sexual abuse and parenting impairment (OR = 3.56; CI: 1.29, 9.77), but for the Southwest tribal area only.

Suicidal behaviors have been linked to perceptions of ineffective parenting in youth of other racial/ethnic and Indigenous groups (263-265). For example, paternal overprotection was positively associated with suicide attempts in Indigenous Sami youth in Norway (263). This may be related to parent-child conflict from generational acculturation differences which appears to be a factor in suicidality among immigrant and Micronesian youth (266, 267). In Latinas, although parent-child conflict has been shown to be significantly and positively associated with suicide attempts, maintaining cultural values, such as familism, was negatively associated with parent-child conflict (267). For Asian immigrant youth, both maternal overprotection and parent-child conflict have been positively associated with depression, although maternal warmth was negatively associated with depression (268). Although empirical research on suicidality in American Indians has not examined the effects of parenting, the relation between ineffective

parenting and youth suicidality has emerged as a theme in qualitative studies, especially in relation to physical, sexual, and emotional abuse (26, 240, 269).

Traumatized parents may impart the consequences of their trauma to their own children. Literature documenting the long-term generational consequences of trauma among children whose parents survived the Jewish Holocaust is the most descriptive, encompassing more than 500 studies. Children of Holocaust survivors display problems coping with stress and a higher tendency for PTSD, especially those whose mothers were diagnosed with PTSD (194, 270). In addition, the second generation exhibits lower psychological well-being and poorer parenting compared to those with no Holocaust background (195). Moreover, if both parents are children of Holocaust survivors the negative effects may extend to third generation grandchildren.

Empirical research in Native populations is beginning to examine the generational effects of life stressors. Data from grandparents (of Native youth) who participated in the 1950 urban relocations show direct and indirect negative effects on their adult female children's mental health, substance use, and parenting ability which were, in turn, linked to poor mental health and delinquency in their grandchildren (271). Findings from the Semi-Structured Assessment for the Genetics of Alcoholism study in American Indians suggest that both assaultive trauma and PTSD symptoms were significantly, though moderately, heritable (272). This moderate heritability is consistent with general population findings (273, 274). Results from another study showed a positive association between parental boarding school attendance and depressive symptoms in their adult children. The offspring of these participants also reported significantly higher levels of childhood adversity, adult traumas, and perceived discrimination than offspring of non-attendees (275). The researchers speculate this may be related to stress proliferation or heightened sensitivity to perceived stressors.

1.5.7. Potential Models

Researchers have proposed several environmental and biological models to explain the generational effects of traumatic stress focusing on Holocaust survivors and their offspring. The most predominant include psychodynamic, sociocultural, family system, and biological models, as well as an integration of the four (198, 276). More recently, epigenetic models have been proposed (277). *Psychodynamic models* propose that children of survivors identify with and internalize, albeit unconsciously, their parent's trauma. Specific to survivors of the Jewish Holocaust, it is thought that the stress of repressed Holocaust experiences, unresolved grief, and social mistrust are internalized by their children who fail to emotionally detach during adulthood, in part through overprotective parenting. Similar to generational family violence

theory (278), *sociocultural models* posit that a family's culture, social norms, and beliefs affect the trauma response via parenting behaviors that are modeled by their children (279). *Family system models* focus on parent-child enmeshment and communication style. This model proposes parent-child role reversals that may restrict child development. This model suggests that generational effects occur through non-verbal, vague, guilt-inducing communication and silence about Holocaust experiences, which is widespread in surviving families (280, 281). This is important in terms of American Indian populations, as well, because silence also is common among First Nations boarding school attendees (282). *Biological models* posit a genetic or biological predisposition to changes in the biological stress response due to trauma (199, 283, 284). Although the above models provide some level of explanation, they may be inadequate, because meta-analysis both confirms and refutes previous results (199). *Epigenetic models* are promising to fill this gap, particularly because generational transmission of hypothalamic-pituitary-adrenal (HPA) axis function has been demonstrated in animal studies (285, 286).

Epigenetic alterations are heritable, potentially reversible variations in phenotypic expression from context-dependent, gene-environment interactions (286, 287). Epigenetic mechanisms may partially explain how the effects of traumatic stressors are passed from parents to their offspring. Researchers speculate that an adverse pre-natal and early life environment, including ineffective parental care, can affect the epigenome and may have mental health implications (288-290). As evidence, animal models have shown increased methylation in rat pups raised by less-nurturing mothers and that upon maturity these pups are more sensitive to stressors, such as confinement that restricts their movement (291). Vulnerability to stress dysregulation may be transmitted from mother to child via epigenetic alterations that may be mediated by biological stress-response mechanisms, such as the HPA axis, a major endocrine system involved in coordinating short-term responses to stress (292). When this type of change occurs during a critical developmental window, it may serve to recalibrate biological systems that influence the response to subsequent traumatic exposure, because the HPA axis is influenced by early life experiences (285, 293-295). This may help explain the neurobiological susceptibility to stress in trauma survivors and subsequent generations. For example, low cortisol levels have been found in adult offspring of Holocaust survivors and in infants whose mothers were directly exposed to the trauma of the World Trade Center collapse during pregnancy (296-298). This is further supported by studies that show increased methylation in newborns exposed to maternal depression (299). The changes appear to be related to glucocorticoid programming in utero due to maternal childhood exposure to adversity, such as

Holocaust survivors (297). Several studies in humans support an epigenetic model for suicide as well as depression and PTSD, noted suicide risk factors (6, 7, 295, 300-302).

Epigenetic mechanisms, a non-reductionist, more holistic approach, have been proposed to help explain what is referred to as the generational transmission of historical trauma in Native populations through modifications in the stress response, especially with regard to adverse childhood experiences (303); however, there are no empirical studies to date. This is a promising line of prevention research because animal studies have shown the potential for reversing DNA methylation in adult offspring through L-methionine supplementation (304). In Native communities, research of this type is complicated by distrust from a history of unethical research conducted in this population, most recently the sharing of blood samples without permission and not returning them as the university institutional review board (IRB) protocol required (210). This is especially troublesome because some tribes have cultural beliefs related to biological human material (305). Tribal self-governance established in the 1980s and 1990s through amendments to the Indian Self-Determination and Education Act enabled tribes to regulate research by establishing their own IRBs. At a minimum, proposed research must be collaborative and provide benefits that are meaningful and useful to the participants and tribal community members (306).

1.6. Psychosocial Protective Factors

Many Native communities have suicide prevention programs that stress the protective value of cultural traditions/spirituality and strengthening community relations; however, few have been evaluated for effectiveness (307). Increasing protective factors has been an effective population-level public health injury prevention approach; child safety seats, seat belts, and air bags have reduced motor vehicle-related deaths and barriers on the Golden Gate Bridge have reduced suicide deaths (308, 309); however, relatively few studies have examined factors protective against suicidal ideation and attempts. In this emerging area of research, results indicate that religion/spirituality (310-312), strong social support (313, 314), family cohesion (82, 92), and high self-esteem (99, 113, 315) are protective against suicidal ideation and attempts.

1.6.1. Spirituality

Religion and spirituality may give meaning and purpose to life that is conducive to emotional well-being; they may provide comfort during life stress and may play a role in appraisal of adverse life experiences (316-318). Research shows that religion/spirituality are

associated with better mental health in both youth and adults (319, 320). Religious community members may connect troubled youth to mental health care or serve as formal or informal mental health care providers (321). Regarding suicide deaths, religion may provide an avenue for social integration and social support (3, 322), particularly in women (323). For example, while African Americans report significantly more life stress than their White counterparts, suicidality is lower for African Americans than other racial/ethnic groups (311). African Americans also report significantly higher levels of religiosity and church attendance, which may account for the difference (324). One study showed a protective benefit of religion on suicidal ideation in African American adults even in the presence of discrimination and depressive symptoms (166). A study in college students found that spiritual well-being was protective against suicidal ideation, although religious participation was not (325). In American Indian adults, high cultural spiritual orientation acted as a buffer against lifetime suicide attempts; however, no significant association was found between commitment to either cultural spirituality or Christian beliefs (310).

1.6.2. Social Support

As a consequence of the colonization practices disrupting American Indian family structure and traditional parenting (31), the transmission of factors deemed protective against suicidality were disrupted as well, including language (326), cultural identity (113), and social support from extended kinship networks (94). Several studies have examined the protective role of social support, family cohesion, and self-esteem on suicidal ideation and attempts in Native youth, with varying results. A comparison of suicidal ideation in youth from three different tribal areas showed that social support was protective against ideation in Pueblo youth, and family cohesion was protective in Southwest youth, while neither appeared protective for ideation in Northern Plains youth (86). Research shows that family cohesion is protective against suicide attempts in boys and girls of all racial/ethnic groups (82, 92, 94, 327); however, differences were found in a study of American Indian youth living in an urban area (99). Although social support was protective against suicide attempts in youth raised in the urban area, it was not protective for reservation-reared youth now living in this urban area. A study of contemporary boarding school students found differences in the effects of social support from family and peers (328). Their results showed that low family support was positively correlated with ever attempting suicide and high peer support was correlated with higher current suicidal ideation. Because social support processes can be culturally determined (329, 330), it is important to use measures that reflect social support systems within a given cultural group (331).

1.6.3. Self-esteem

Self-esteem levels vary by racial/ethnic group, with meta-analysis showing lower self-esteem in American Indians compared to White, Black, and Hispanic Americans, but not Asian Americans (332). The racial/ethnic differences in levels of self-esteem may be influenced by cultural values, as well as demographics. For example, high self-esteem was positively associated with individualism, which is contrary to American Indian culture, which is higher in collectivism (333). Despite this difference, research shows that higher levels of self-esteem appear protective against suicidal ideation across racial/ethnic groups (267, 315), including American Indian youth (113).

1.6.4. Resilience

Resilience, continuity (self and cultural), ethnic identity (personal and collective), and coping are influenced by psychosocial development and are embedded in sociocultural context. The concept of resilience denotes the ability to positively cope with and adapt to stress and adversity (334). This is an emerging area of research without a common underlying theoretical construct or standard operationalization in either general or Native populations (112, 335-338).

Components of the resilience construct, such as a positive attributional style and higher levels of agency, have been shown to buffer suicidality (339, 340). A recent review of this literature expressed the importance of using validated, multi-item inventories to measure resilience to address methodological concerns (339); however, only one study has assessed the psychometric properties of resilience measures in American Indian populations (341).

Studies in Native populations have examined resilience in relation to multi-level influences in youth (336, 342); as a moderator between violence and development of PTSD symptoms (343); its relation with self-esteem, enculturation and Native spirituality (344, 345); surviving a family suicide (346); associations with personal and social assets, such as pride, self-esteem, mastery, and parental and social support (347); and, as a framework for understanding youth suicide and domestic violence prevention research (112, 348).

Several mechanisms have been proposed for positively adapting after traumatic events (349), including: psychodynamic (secure attachment) (350), neurobiological (351), epigenetic (352), developmental (353), and social learning (279). However, the literature for trauma and resilience is not as elucidated as the trauma and stress research.

1.6.5. Continuity

Having a secure sense of oneself (self-continuity) and one's culture (cultural continuity) as a connected part of the past, present, and future has been shown to be protective against suicide (15, 28, 29). In turn, disruptions to personal or cultural persistence are suicide risk factors. Developmentally, critical transitions take place during adolescence that may disrupt a younger person's sense of self-continuity and their ability to cope with and adapt to life stressors. Research has found self-continuity practices (such as ability to see oneself moving into the future) in non-suicidal youth; however, minimal practices were noted in suicidal youth (15). This line of research also has noted cultural variations in perceptions of self-continuity, possibly reflecting a more analytic western, as opposed to a more holistic Native, worldview (354). Whereas Native youth viewed continuity through relational solutions, non-Native youth tended to choose concrete elements, such as name to judge their persistence through time (355, 356). This research also showed that for Indigenous people, suicide rates varied from place to place, but non-Indigenous suicide did not, indicating the presence of certain community elements for the tribal bands in this study that reported zero suicides ($n = 111$; 56.6%) over the 14-year time period of the study (28, 29).

The dramatic changes that have occurred in Indigenous communities have disrupted a sense of community, or cultural, continuity which has also affected the transmission of potential protective cultural elements to younger generations, such as language and cultural identity. However, the disruption has not been consistent across US tribes or Canadian First Nations bands. Research findings show remarkable differences in First Nations youth suicide rates across levels of *cultural continuity* markers (land claims, self-government, band-run services [i.e., education, police and fire, health, and child services], presence of a cultural facility, and women in government). Tribal bands with fewer cultural continuity markers had drastically higher youth suicide rates than those with more markers. Moreover, bands with all eight markers reported zero youth suicide deaths (28, 29). Also, bands with a conversational knowledge of their language had fewer youth suicides than bands without this knowledge, independent of other markers of cultural continuity (326). If Native youth suicide is related to disrupted development, it stands to reason that being involved in and identifying with one's culture may be a key protective factor. Culture provides a foundation that gives meaning to life and a way to see oneself moving into the future (316, 357). Culture also sets limits to behaviors through taboos, including taking one's own life (358).

1.6.6. Enculturation

Culture consists of belief systems that provide people with ways of making sense of the world. Culture consists of “systems of socially constructed meanings, beliefs, and values that symbolically convey interpretations of what reality is and ought to be” (359). Culture is further described as “webs of significance” (360), as well as a “tradition of interpretation” (357). Whether due to assimilation policies, for survival, or as an adaptation, Native American culture has undergone vast changes (361). Responses to these changes have included revision of cultural practices; cultural revitalization; and, as often occurs when cultures meet, a syncretic blending of Native, non-Native, and inter-tribal practices (361, 362).

In the context of Native health, several researchers have argued the protective benefit of *enculturation*; however, results vary across studies. Zimmerman et al. defined enculturation as the “process by which individuals learn about and identify with their traditional ethnic culture” (363). In studies of American Indians, enculturation is frequently composed of three components: cultural identity, participation in traditional activities, and participation in spiritual activities. Using this conceptualization, buffering effects have been noted for alcohol abuse in adults (178, 364) and discrimination and depression in Navajo youth (365, 366). However, enculturation did not buffer the effect of discrimination in American Indian adults (178).

Some studies have examined individual components of enculturation, primarily cultural identity. For example, strong cultural identity in Hawaiian youth was a statistically significant risk factor for suicide attempts, while Hawaiian ethnicity itself was not (76). In another study, higher maternal American Indian cultural identity was significantly associated with higher social-emotional development in their toddlers (258). In addition, high levels of some aspects of ethnic identity (e.g., pride) appear to significantly suppress the impact of perceived discrimination on depression in First Nations adults (367). Consistent operationalization of ethnic identity and enculturation is an important consideration.

Results vary in studies of suicidal ideation and attempts as well. For example, enculturation appeared protective for suicidal ideation in a study of Midwest American Indian youth (113); however, a study that used cultural identity alone showed no significant association for either ideation or attempts in Southwest youth (99). In another study, no significant association was found between ideation and cultural identity in youth from three tribal areas (Southwest, Northern Plains, Pueblo) (86). It has been suggested that including language in the cultural identity construct may help eliminate or reduce discrepancies in the results (368), because language is strongly intertwined with culture. As previously noted, a conversational knowledge of traditional language acted as a buffer against suicide deaths (326), so we might

expect similar results for suicidal ideation and attempts. In addition, strong ethnic identity was associated with a strong sense of community and positive affect in Northern Plains American Indian youth (369). This is important because connectedness to community has been shown as a statistically significant protective factor for ideation in Native adults (191).

Identity formation is an important developmental and psychosocial adolescent task that has implications for health and well-being in adulthood (370-373), including the emerging adulthood of most college students (374). Healthy development can buffer the negative effects of stressors like discrimination (365). Barriers to identity development in American Indian youth include exposure to and difficulty sorting out conflicting values from the dominant culture, limited number of adequate adult role models, limited parent-child communication, and trying to find their place in sometimes ethnically and tribally diverse sociocultural contexts (375). It is important to not only understand the parallel development of resilience, self-esteem, and identity, but also the developmental impact of traumatic stressors and coping skills.

1.6.7. Coping

Coping is defined as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (376). Because ability to cope with stress is dependent on psychosocial development, it is more difficult for children to deal with adversity; they have not developed the coping strategies or accumulated the necessary resources to adapt to stressful situations. More successful strategies, like problem-focused coping, come with life experience (37). Culture also is an important factor in the stress-coping process, and may affect the types of stress experienced, their appraisal, and preferred and available coping strategies (40, 366). In addition, choice of coping strategy is often gender-based, for example, research shows that women tend to seek social support when under stress more often than men do (38, 39).

The way we respond, or adapt, to perceived life stressors (i.e., cope) may affect our health. Unhealthy responses (e.g., substance use, anger, denial, or venting) can be detrimental to health (377-379). Research shows that emotion-focused coping responses (escapism, self-blame, minimization) are positively associated with depressive symptoms; whereas problem-focused coping responses (instrumental action, negotiation) are negatively associated with depressive symptoms, especially in combination with high self-efficacy (380). A variety of coping classifications have been noted including: (1) active (primary) coping, such as problem solving or support seeking to help change the situation or one’s emotional reaction; (2) accommodative (secondary) coping, such as distraction or acceptance to adapt to the situation; and, (3)

disengagement strategies such as avoidance or withdrawal (381). Coping can also be anticipatory in that strategies such as vigilance are used to prevent or minimize future potential adversity, for example, in relation to anticipated discrimination (382).

Several studies have examined stress, coping, and various health outcomes among Indigenous people. A study among the Yupik found healthier coping strategies and greater well-being in residents of a more traditional Yupik village who reported using religion/spirituality more, and alcohol/drugs less, than residents of a non-traditional village (383). Focus groups conducted among Canadian First Nations provided broader explanations. For example, Iwasaki and colleagues examined coping strategies for life stressors in First Nations diabetics (384). Coping themes included (1) focusing on strengths (individual, collective); (2) maintaining a balance of mind, body, and spirit; and, (3) promoting positive transformations through spirituality, interdependence, and cultural identity.

For many Natives, coping, resilience, traditional worldview, and healing are intertwined. Research conducted among Canadian First Nations residential school survivors revealed similar culturally informed ways of coping and healing from physical and sexual abuses they experienced in the schools (385). Healing strategies include maintaining or reestablishing: (1) a balance in life; (2) interconnectedness to the world; (3) traditional spirituality, healing practices, and cultural values; (4) connections to family and community; (5) a connection with nature; and (6) guidance from tribal role models or mentors. Also, preliminary data from American Indian youth in the study area found that they used a variety of unhealthy coping strategies, such as cutting, substance use, and violence to cope with stress in their lives (26). The youth also emphasized the importance of keeping busy, engaging in outdoor activities, seeking family and community support, and involvement in cultural activities (e.g., hand games, singing, participating in ceremonies) to deal with stress in a constructive way. These findings show that cultural values and traditions are promising coping strategies to help American Indian communities deal with past and current life stressors.

Although several studies have examined associations between stress and suicide, a limited number have examined how coping affects suicidality and related risk factors. Suicidal youth and adults tend to use fewer and less effective coping strategies than their equally stressed counterparts (34). For example, youth who had not attempted or thought about attempting suicide reported significantly more cognitive reframing and talking about their feelings than youth reporting suicidal behaviors (34). A study of multi-racial youth showed that problem-focused coping was positively associated with suicidal ideation (35). A study in Navajo youth found that primary (e.g., problem-solving) and secondary (e.g., acceptance) coping were

negatively associated with depressive symptoms; disengagement (e.g., denial) was positively associated with depressive symptoms (381). A study of coping strategies and substance use found that American Indian youth reported using significantly more denial and self-blame and significantly less active coping and acceptance than White youth (386).

1.7. Addressing the Gaps

In summary, this dissertation addresses several gaps and inconsistencies evident in the literature. First, this research will expand knowledge of risk factors for suicidal ideation and attempts in American Indian youth in an under-researched tribal area. Second, this research will broaden the field by examining the association between suicide risk and culturally unique risk factors, such as childhood adversity, discrimination, generational out-of-home placement, unresolved grief, and ineffective parenting in American Indian tribal college students. Perceptions of ineffective parenting have been linked to suicidality in other Indigenous groups (263). In addition, research in the general population has shown a significant association between complicated, unresolved grief and suicidality (387). This research will be the first to examine these associations in American Indians. Third, this work will add to the literature by examining the association between suicidality and potential protective factors, such as resilience, enculturation, and cultural values, as well as the effect of coping skills and social support on suicidality in American Indian tribal college students. In addition to filling gaps, this research is innovative in several ways. Although conceptualized (24, 25, 36), a stress-coping model has not been tested in this population. The setting is also unique in that limited research has been undertaken in Montana-Wyoming tribal areas. In addition, limited suicide research has been conducted with American Indian college students and no suicide research has been conducted with students attending tribal colleges (88, 388). This is a unique opportunity because seven (19%) of the nation's 36 accredited tribal colleges are located in these states. The tribal college setting offers a unique opportunity to test this model, which allows consideration of the effect unique cultural strengths have on culturally unique, as well as generalized stressors, in the lives of American Indians. Suicidality is a major public health issue in this population. A comprehensive understanding of culturally unique life stress and cultural buffers will help to inform effective interventions and reduce morbidity and mortality related to this problem.

The following specific aims will be used to fill these gaps:

Specific Aim 1: Identify gender-specific individual-level risk factors associated with suicidal ideation/attempts for American Indian and White Montana high school students using pooled *random sample* secondary Youth Risk Behavior Surveillance System (YRBS) data.

Hypothesis #1. American Indian youth will have a higher prevalence of suicidal ideation/attempts than White youth.

Hypothesis #2. Sadness/hopelessness will show the strongest positive association with suicidal ideation/attempts for all youth.

Hypothesis #3. There will be differences in suicidal ideation/attempt risk factor profiles for the American Indian and White youth (e.g., types of victimization and coping strategies).

Specific Aim 2: Identify gender-specific individual-level risk factors associated with suicidal ideation and suicide attempts in American Indian students attending Montana reservation and urban high schools using pooled *volunteer sample* secondary YRBS data.

Hypothesis #1. Reservation youth will have a lower prevalence of suicidal ideation and suicide attempts than the urban youth due to access to protective influence of cultural practices and ethnic identity development.

Hypothesis #2. There will be differences in risk factor profiles (e.g., types of victimization and coping strategies) for suicidal ideation and attempt for the reservation and urban settings for girls and boys.

Specific Aim 3: Test a model of the relation between life stressors (i.e., adverse childhood experiences, discrimination, generational out-of-home placement, unresolved grief, and ineffective parenting skills), poor mental health, enculturation, resilience, coping skills, social support, self-esteem, and gratitude on suicide risk in American Indian tribal college students using primary survey data.

Hypothesis #1. Higher levels of life stressors (i.e., adverse childhood experiences, discrimination, generational out-of-home placement, unresolved grief, and ineffective parenting skills) and poor mental health will be positively associated with suicide risk.

Hypothesis #2. Higher levels of enculturation, resilience, constructive coping skills, social support, self-esteem, and gratitude will mitigate suicide risk.

CHAPTER 2. A COMPARISON OF RISK FACTORS ASSOCIATED WITH SUICIDAL IDEATION/ATTEMPTS IN AMERICAN INDIAN AND WHITE YOUTH IN MONTANA

2.1. Abstract

Introduction. We examined racial/ethnic and gender-specific associations between suicidal ideation/attempt and risky behaviors, sadness/hopelessness, and victimization in Montana American Indian and White youth with aggregated 1999-2011 Youth Risk Behavior Survey data.

Methods. We used logistic regression to calculate odds ratios and 95% confidence intervals in stratified racial/ethnic-gender groups.

Results. The primary results of this study show that although the American Indian youth had more statistically significant suicidal thoughts and attempts than the White youth, American Indian youth had fewer statistically significant risk factors compared to the White youth. Sadness/hopelessness was the strongest, and the only positively and statistically significant, risk factor for suicidal ideation/attempts common across all four groups. The unhealthy weight control cluster was a positive and statistically significant risk factor for the White youth and the American Indian girls; the alcohol/tobacco/marijuana cluster was a positive and statistically significant risk factor for the American Indian boys only.

Conclusion. Results show important differences across the groups and indicate directions for future research targeting prevention and intervention. Although there were differences in magnitude across the race/ethnic-gender groups, after sadness, victimization appears to be the most potent indicator of suicidal ideation/attempts in all groups. Mental health, school safety, dating violence, and substance use screening, and referral to culturally sensitive and gender-specific counseling are warranted.

2.2. Introduction

Suicide deaths, non-fatal suicide attempts, and suicidal ideation (e.g., thinking about, considering, planning for suicide) are a worldwide public health problem for Indigenous (e.g., American Indian, Alaska Native, Canadian First Nation, New Zealand Maori, Australian Aborigine) people, especially those under age 25 years (52, 53, 62, 389). In the US, American Indian/Alaska Native (AI/AN) youth report significantly more suicide-related thoughts and behaviors than youth from other racial/ethnic groups, including attempting suicide up to 2.5 times more often than these other youth (78). As with other racial/ethnic groups, AI/AN girls report attempting suicide almost twice as often as AI/AN boys (82).

Poor mental health, especially depression, is consistently associated with the greatest risk for suicidal ideation/attempts (11, 120, 121); however, there are other potentially modifiable factors. Research also shows a direct relation between suicidal ideation/attempts and psychosocial risk factors such as exposure to suicide by family or friend (82, 99), substance use (99, 113, 120, 390, 391), and victimization, such as physical and sexual abuse (53, 82, 102), dating violence (97, 104), and sexual assault (49, 97) across racial/ethnic groups. All in all, the prevalence of most of the risk factors is highest in AI/AN youth (78).

Studies have also shown associations between suicidal ideation/attempts and several other psychosocial risk factors, such as early risk-taking behaviors (264), issues around weight control and body image (390, 392), risky sexual behaviors (390), and bullying (393); however, these studies did not include AI/AN youth. Besides the potential risk factors listed above, other unique areas of concern for AI/AN youth include earlier initiation and more frequent use of alcohol, tobacco, and other illicit drugs (78), higher exposure to suicidal thoughts and behaviors (394), discrimination (113, 178), out-of-home placement (226), and family history of boarding school attendance (229).

Although suicidal ideation/attempts is a growing health concern among AI/AN youth, a limited number of studies have included AI/AN youth in the examination of racial/ethnic differences. Rutman et al. (80) examined differences between AI/AN and White youth in urban schools and Pavkov et.al. examined national level racial/ethnic differences (78); however, these analyses were largely descriptive and did not examine risk factor associations. Another study surprisingly found American Indian race/ethnicity to be a protective factor for 3 month suicidal ideation/attempts (11); however, this study was set in a region that differs demographically from western states that have multiple reservations and different tribes (www.census.gov; 2010 data). In addition, the researchers did not stratify by racial/ethnic group or gender (11). A recent

study found both differences and similarities in risk factors for suicide attempts between Native and non-Native youth; however, they controlled for, rather than stratified by, gender (87).

The present study focuses on the state of Montana, which has the highest suicide rate in the 48 contiguous states. Montana has multiple tribal areas, including seven reservations and five urban areas. American Indians are the most visible minority group in Montana, comprising about 7.7% (76,000) (www.census.gov; 2010 data) of the total population. The purpose of the present analyses is to examine racial/ethnic and gender-specific associations between high-risk behaviors, sadness/hopelessness, victimization, and risk for suicidal ideation/attempts in American Indian and White youth in Montana using Youth Risk Behavior Survey (YRBS) data. To our knowledge, an analysis of YRBS suicide data for a Northern Plains state such as Montana has not been published. Understanding unique and shared gender- and racial/ethnic-specific risk factors associated with suicidal ideation/attempts is important to help inform suicide prevention intervention to decrease the prevalence of suicidal ideation/attempts in this vulnerable group.

2.3. Methods

2.3.1. Sample and Participants

The YRBS is a self-report epidemiological survey conducted in odd years in randomly selected high schools across the nation. The survey monitors health behaviors in six categories: unintentional injury and violence; tobacco use; alcohol and other drugs; sexual behaviors; physical activity; and dietary behaviors. A three-stage cluster sample design is used to produce a nationally representative sample of high school students (grades 9–12). The first-stage sampling frame is on the county level, the second is on the school level, and the third is on the classroom level. All students in the classroom level sample are eligible to participate. Schools, classes, and students may refuse to participate and are not replaced. Parental permission to complete the survey is secured locally following local parental permission procedures. The self-administered in-person questionnaire was completed during one class period with responses recorded by the student on an answer sheet (395).

The school response rate for the annual sample of Montana schools ($N = 50$) ranged from 94% to 98% over the study time period. There are two tribally run schools in the state and they participate. The vast majority of schools are rural. For the present analyses, data for Montana American Indian (self-identified) girls ($n = 628$) and boys ($n = 695$) and White girls ($n =$

8814) and boys ($n = 8715$) in grades 9-12 were extracted from the YRBS for the seven combined odd years from 1999-2011 ($N = 21,610$).

2.3.2. Variables

Because changes had been made to the YRBS over the study time-period, we only included variables that were used in all seven years of data in the analyses; the questions were identical. The dependent variable was a positive response to at least one of the following: *“During the past 12 months, how many times did you actually attempt suicide?”* (yes = 1 or more times; no = 0 times), *“During the past 12 months, did you ever seriously consider attempting suicide?”* (yes; no), or *“During the past 12 months, did you ever make a plan about how you would attempt suicide?”* (yes; no). We determined seriousness of intent by the question *“If you attempted suicide during the past 12 months, did any of your attempts result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?”* (yes; no). Preliminary analyses showed little to no difference in the statistical significance of individual risk factors for suicidal ideation and suicide attempts. Therefore, to increase power, we used cluster analysis to combine the variables into more meaningful clusters and to help to reduce multicollinearity in variables that were similar. The variables were coded in the direction of high risk. In addition to sadness/hopelessness (feeling sad or hopeless every day for 2 weeks or more during the past 12 months), we selected 29 independent variables and grouped them into 9 clusters: (1) alcohol, tobacco, and marijuana use (current and binge drinking, riding with someone who had been drinking and driving while drinking during past 30 days, current tobacco use, current marijuana use); (2) unhealthy weight control (fasting, taking diet pills, purging to lose weight during the past 30 days); (3) early risk-taking behavior (smoking cigarettes, drinking alcohol, using marijuana, or having sex before age 13); (4) partner victimization (past 12 months dating violence, ever sexually assaulted); (5) lack of personal safety at school (feeling unsafe [past 30 days], being threatened [past 12 months]); (6) risky sexual behaviors (more than 4 sex partners in lifetime, more than 1 sex partner in the past 3 months, alcohol/drug use before last sexual intercourse, no condom use with last sexual intercourse); and (7) weapon carrying (carried a weapon and/or a gun during the past 30 days); as well as two illicit drug clusters (8) injection (ever use heroin, steroids, and needle drugs) and (9) inhalant [cocaine (ever, current) and ever use methamphetamines]). Because the clusters contain different numbers of risk behaviors, we used the mean for each cluster in the analyses.

2.3.3. Procedures

Variable clustering is a widely accepted statistical method used to reduce the dimensionality of prediction models (396). However, there are not a sufficient number of studies in the literature concerning grouping these specific variables to form a well-grounded hypothesis of which variables to cluster. As we did not want to bias the analyses by improperly clustering variables, we allowed the data to show us where the clusters were. Similarity in some items would also have created problems with multicollinearity. We used the non-hierarchical version of Proc Varclus in SAS Version 9.2 to create the clusters. It uses an iterative process to create groups of variables that are as correlated as possible within a cluster and as uncorrelated as possible with variables in other clusters (396). We used partitive clustering with the default 0.7 eigenvalue threshold to split the clusters. We selected 9 clusters at the point where the clusters were formed of variables that were not substantially different from other iterations.

2.3.4. Statistical Analyses

Analyses were stratified by racial/ethnic group and gender and were carried out with SAS Version 9.2. First, simple frequencies were established to determine gender and racial/ethnic-specific prevalence estimates. Chi-square tests of association were used to determine significant racial/ethnic and gender between-group differences. A Bonferroni correction was used to account for multiple testing, so differences in prevalence estimates were considered statistically significant at the $p < .0005$ level. We then conducted logistic regression analyses (forward selection) using *age* as a control variable. We hypothesized that depression might be the key underlying risk factor, because it consistently shows the greatest independent risk for suicidal ideation/attempts (11, 121). Depression is also associated with several of the risk factors discussed here (e.g., bullying, smoking, and alcohol, marijuana and other substance use) (123). Because sadness/hopelessness was the only reasonable surrogate we had for depression in the YRBS, it served as a proxy in the logistic regression models. We also hypothesized that American Indian youth will have a higher prevalence of suicidal ideation/attempts than White youth and that there will be differences in suicidal ideation/attempt risk factor profiles (e.g., types of victimization and coping strategies) for American Indian and White youth. Proc SurveyLogistic was used to account for complex sampling and to facilitate generalizability across all Montana high school students. All analyses were weighted to account for the complex sampling design and to reduce nonresponse bias (397).

Following their code of regulations, all aspects of this study, including this article, received approval from the Rocky Mountain Tribal Institutional Review Board located in Billings, Montana.

2.4. Results

2.4.1. Descriptive Statistics

Descriptive statistics can be seen in Appendix A; Table 1. During the study time-period, more than twice as many American Indian youth ($n = 169$; 15.5%) in Montana reported attempting suicide one or more times during the past 12 months than White youth ($n = 1111$; 7.1%). In addition, twice as many American Indian youth ($n = 54$; 4.9%) reported an injury associated with attempted suicide, in comparison to White youth ($n = 361$; 2.3%). Both attempt ($n = 106$; 19.6%) and attempt with injury ($n = 35$; 6.5%) were highest in the American Indian girls and a higher proportion of these girls reported considering ($n = 165$; 26.8%) and planning for ($n = 131$; 21.0%) an attempt during the past year.

Almost twice as many girls reported sadness/hopelessness as boys in their respective racial/ethnic-groups, with American Indian girls ($n = 267$; 43.2%) reporting the highest. Compared to the White girls, the American Indian girls reported significantly more suicidal thoughts ($p = .0003$), suicide attempts ($p < .0001$), injury with attempt ($p < .0001$), sadness/hopelessness ($p < .0001$), early risk-taking behaviors ($p < .0001$), feeling unsafe at school ($p < .0001$), dating violence ($p < .0001$), and fasting to lose weight ($p < .0001$). Compared to the White boys, a significantly higher percentage of American Indian boys reported suicidal thoughts ($p < .0001$), suicide attempts ($p < .0001$), sadness/hopelessness ($p < .0001$), smoking cigarettes or marijuana or having sex before age 13 ($p < .0001$), sexual assault ($p < .0001$), and using diet pills, fasting, or purging to lose weight ($p < .0001$).

2.4.2. Logistic Regression Analyses

Results from the regression analyses (Appendix A; Table 2) show differences and similarities across the racial/ethnic and gender groups. Unless otherwise indicated, all statistically significant risk factors are positively associated with suicidal ideation/attempts. As hypothesized, sadness/hopelessness was one of the strongest risk factors for suicidal ideation/attempts and was the only statistically significant risk factor common across all four groups: American Indian girls (OR = 4.13 [2.51, 6.81]); American Indian boys (OR = 6.23 [3.59, 10.80]); White girls (OR = 6.57 [5.76, 7.49]); White boys (OR = 8.80 [7.53, 10.28]). The

unhealthy weight control cluster was a statistically significant risk factor for suicidal ideation/attempts for the White boys and girls and the American Indian girls, but not the American Indian boys. In addition to sadness/hopelessness, unhealthy weight control was also the only significant risk factor for the American Indian girls. There was an inverse association between age and suicidal ideation/attempts in all groups except the American Indian boys. For the American Indian boys, in addition to sadness/hopelessness, the alcohol/tobacco/marijuana cluster and the weapon carrying cluster were statistically significant risk factors for suicidal ideation/attempts.

The White girls had more significant behavioral risk factors for suicidal ideation/attempts than any other group. In addition to sadness/hopelessness and the unhealthy weight control cluster, other statistically significant risk factors for suicidal ideation/attempts in these girls included alcohol/tobacco/marijuana, early risk-taking behaviors, lack of personal safety at school, partner victimization, and weapon carrying. Like White girls, White boys also showed significance for lack of personal safety at school, early risk taking behaviors, and partner victimization. White boys were the only group where risky sexual behaviors were also a significant risk factor.

2.5. Discussion

The primary results of this study show that although the American Indian youth had more statistically significant suicidal thoughts and attempts than the White youth, they had fewer statistically significant risk factors compared to the White youth. Specifically, while the American Indian youth reported significantly more partner victimization, lack of personal safety at school (feeling unsafe at school only), early risk taking behaviors, and risky sexual behaviors than the White youth, these clusters were significant risk factors for suicidal ideation/attempts for the White youth only.

Sadness/hopelessness was one of the strongest risk factors for suicidal ideation/attempts and the only risk factor that was common across the four racial/ethnic-gender groups. The importance of sadness/hopelessness as a risk factor for suicidal ideation/attempts is not surprising because we know that depression is the strongest risk factors for suicidal behaviors (11, 120-122). Our data show that American Indian youth have significantly more sadness/hopelessness than their White counterparts. This finding is consistent with some studies (123), but not all (78, 398). The reason for this discrepancy in findings on depression in American Indian youth is unclear; however, it may result from variation in the age range of the

study populations. For example, some studies focus on middle school youth (398), who report the lowest prevalence of depressive symptoms, while others focus on high school (78, 79) aged youth or combine the age groups (81, 99, 123). This is important since research shows that depressive symptoms increase with age (399).

The fact that substance abuse is greater in the American Indian youth may be an indication that they are self-medicating. Substance abuse and depression frequently co-occur in youth (400), so examination of factors underlying these co-morbidities in this population is warranted. That three out of the four groups had issues with unhealthy weight control is not surprising when seen from the perspective of researchers who see fasting, purging, or taking diet pills to lose weight as a method of coping with stress, similar to the use of substances as a maladaptive coping strategy (401).

The limited number of statistically significant risk factors for the American Indian youth may indicate that the YRBS does not capture the areas of greatest risk for them. For example, a risk factor that was not included was discrimination, which has been linked to substance use and suicidal ideation in middle school aged American Indian youth (113, 177).

Also, baseline data from a Canadian First Nations longitudinal health survey show significantly greater suicidal ideation/attempts among both youth and adults who had at least one parent or grandparent attend the now renowned abusive federal boarding schools for American Indian children (206, 209, 212) compared to offspring of non-attendees (229). In addition, several generations of American Indian children have been disproportionately placed in foster care or adopted out, almost exclusively with non-Native families (208, 222). The abuse and lack of nurturance in the federal boarding schools where children were not even allowed to speak their own language was a poor preparation for learning to parent their own children (31). Even removing children from their families has consequences that may be detrimental to forming healthy relationships and cultural identity, (e. g., the intergenerational transmission of traditions), as well as mental health (resulting in substance abuse to cope with stress) (31, 48, 239, 240).

It is interesting that partner victimization was not associated with suicidal ideation/attempts in the American Indian youth in the multiple variable models even though it was significantly more prevalent in the American Indian than White youth and was also a significant risk factor in the White youth. This is not consistent with the limited sexual assault data in Native youth, where ever being sexually assaulted was a significant risk factor for suicide attempts (49, 82). Due to the cross-sectional nature of the data in the current study and the wording of the sexual assault question, it was not possible to determine the context in which the violence

occurred, i.e., whether child sexual abuse was involved. So we ran *post hoc* multiple variable models for the American Indian youth with dating violence and sexual assault as separate, unclustered variables to see if they contributed differently to the model, but they did not. Neither dating violence nor sexual assault were statistically significant risk factors for suicidal ideation/ attempts in these *post hoc* analyses.

Most studies of suicide in American Indians focus on risk and relatively few studies have examined protective factors. Research indicates that several psychosocial factors, such as religion/spirituality (310, 311, 324) and strong social support (82) may be protective against suicidal ideation/attempts across racial/ethnic groups. Enculturation (i.e., participation in traditional social and spiritual activities and cultural identity) and high self-esteem have been reported to be protective against suicidal ideation among middle school aged American Indian youth but this has not been studied in older youth (113). Since factors related to self-esteem and culture are not available in our dataset we could not test this hypothesis in our sample.

This study is subject to several limitations. First, these data are limited by the nature of self-report data, namely, underreporting and recall bias; and, by the fact that they are cross-sectional, which makes attribution of causality difficult. Second, data are only collected on youth enrolled in school. Youth who have dropped out of school and may be at even higher risk are not included. The average dropout rate for Montana American Indian students during the study time-period was about 6.5%, compared to about 2.5% for White students (402). In addition, the YRBS no longer includes socioeconomic variables, which may be important given the extensive poverty of American Indian youth (11, 403). There are also no questions related to other risk factors which may be relevant for American Indian youth, such as discrimination (113, 178), exposure to suicide of others (82, 99), out-of-home placement (404), or access to and use of mental health care services (405). In addition, there is only one question that could possibly reflect depression and no questions related to PTSD or other relevant mental health issues (11). To test whether low power could be responsible for the lack of significant risk factors in the American Indian youth, we used JMP Pro Version 11 to calculate effect sizes. Using Cohen's effect size taxonomy (406), these analyses revealed that our gender-specific sample sizes for the American Indian youth correspond to 80% power for effect sizes around .20-.22, which is equivalent to small or perhaps medium effect sizes. This leads us to believe that low power is not an issue.

It should also be noted that the YRBS does not differentiate between what are perceived as negative behaviors/emotions and aspects of these behaviors/emotions that may have culturally distinct meanings in American Indian youth. For example, the concept of depression or

sadness/hopelessness, though normally seen as negative in other populations, can have positive connotations for American Indian youth, i.e., be perceived as a strength, if it is born with a sense of honor and kept in one's heart as a reminder to have compassion for others (407). Another example is the topic of tobacco smoking, normally perceived as a risk behavior in mainstream society, but which may be part of traditional ceremonial practices to which the youth would respond affirmatively. An American Indian youth may also admit to carrying a weapon. However, the survey does not differentiate between a weapon that is part of ceremonial and/or dance regalia, i.e., as symbolic of warrior status, so we do not know how they interpret 'weapon' when they respond. Furthermore, the YRBS does not differentiate between urban and reservation American Indian youth. As stated above, it also does not include questions related to protective factors. Inclusion of these types of variables in future research may contribute to improving knowledge of the issues underlying suicidal ideation/attempts in this population. In spite of these limitations, the YRBS is a readily available source of risk factor data that covers a broad range of suicidal ideation/attempts questions that show both convergent and discriminant validity (408).

As strengths, this study combined seven years of YRBS data for statistically meaningful numbers of American Indian youth and no study to date has examined gender- and racial/ethnic-specific differences in this regionally representative sample. Many American Indians are cautious, meaning that openness with outsiders is minimal and information is not freely shared (409). However, given the anonymous nature of the YRBS, these results are more likely to provide an accurate reflection of American Indian youth behavior than structured interviews. In addition, the complex sampling design and non-response weighting allow for generalizability across Montana high school students as well as students from states with similar population characteristics.

Despite the public health importance of suicide, only limited research has been conducted on suicide risk in American Indian youth (389). Despite the caveats, this study has some important public health implications. It shows that factors predicating suicidal ideation/attempts in American Indian and White youth differ and that our current databases are probably not capturing some of the risk factors that are relevant for prediction of suicidal ideation/attempts in American Indian youth. The fact that age was inversely associated with suicidal ideation/attempts indicates that early intervention should be a high priority. The current data also tell us that screening for sadness/hopelessness, school safety, and substance use, as well as referral to culturally meaningful and gender-specific counseling are important. Future research aimed at identifying risk factors for suicide in American Indian youth should include

culturally relevant factors such as discrimination and out-of-home placement, as well as protective factors such as social support and enculturation in order to design evidence-based interventions based on cultural strengths.

CHAPTER 3. RESERVATION-URBAN COMPARISON OF SUICIDAL IDEATION AND ATTEMPTS IN AMERICAN INDIAN YOUTH

3.1. Abstract

Introduction. Although research is beginning to address suicide risk in urban American Indian youth, most suicide research in this population focuses on American Indian youth living on or near reservations. Relatively few studies have made comparisons between urban and reservation populations. The objective of this study was to identify gender and location-specific individual-level risk factors associated with suicidal ideation and suicide attempts in American Indian youth.

Methods. Biennial data for 6417 American Indian high school students were extracted from the Montana *volunteer sample* Youth Risk Behavior Survey data for pooled years 2003 to 2011. Logistic regression was used to identify gender-specific individual-level risk factors associated with suicidal ideation and attempts in American Indian students attending Montana reservation and urban high schools.

Results. Findings show that the prevalence of suicidal ideation and suicide attempts did not significantly differ between reservation and urban American Indian youth. However, regression analyses showed differences and similarities in significant risk factors for ideation and attempts for girls and boys across the locations. Fewer differences were noted for girls than boys. Sadness/hopelessness was the only statistically significant risk factor for suicidal ideation and attempts common for girls and boys in both settings. Some form of violence (partner victimization, lack of school safety) was positively and significantly associated with either ideation and/or attempts in almost all groups. Partner victimization was significantly associated with both outcomes for girls, but was inconsistent for boys. Lack of school safety was significantly associated with suicide attempts across the four groups, but was not a significant risk factor for ideation. Unlike girls, reservation and urban boys differed in identified risk factors for both ideation and attempts. Reservation boys who contemplated but did not attempt suicide showed significant associations with early risk-taking behaviors, partner victimization, and weapon carrying. Urban boys who actually attempted suicide had far more significant risk factors than reservation boys.

Conclusion. The results indicate that although the prevalence of suicidal ideation or attempts did not differ for American Indian youth in reservation and urban settings, the risk factors did, especially for boys. In girls, risk factors differed by location primarily for ideation. This is important since American Indian youth report significantly more suicide-related thoughts and behaviors than other youth. Future research that focuses on multilevel and culturally unique risk and protective factors is essential to design meaningful prevention and intervention programs.

3.2. Introduction

Research consistently shows higher suicidality (deaths, non-fatal attempts, and ideation) in Indigenous populations worldwide, compared with their national counterparts (51, 52). Data also show clear tribal and geographic variations in the prevalence of suicidal ideation and attempts and associated risk factors in American Indian youth (76, 410, 411). Although studies are beginning to address suicide risk in urban American Indian youth (49, 80, 112), most suicide research in this population focuses on American Indian youth living on or near reservations (62, 82, 113, 114, 120, 124). Relatively few studies have made comparisons between urban and reservation populations (28, 99). Of these, Chandler and Lalonde found higher suicide rates among British Columbia First Nations youth living in urban and surrounding areas as opposed to rural or remote locations (28). In addition, a study of 314 American Indian youth noted higher suicidal ideation and psychosocial problems in reservation-reared youth than urban-reared youth; there were also differences in types of risk factors for suicide attempts in these youth (99). In that study, depression showed a significant association with suicide attempts for the reservation-reared youth only and alcohol abuse/dependence showed a significant association for the urban-reared youth only. Neither study examined gender differences.

Chapter 2 of this dissertation reports differences in risk factors for American Indian and White youth, but did not have data to identify school location (412). That study showed that sadness/hopelessness was the strongest, and the only statistically significant, risk factor for suicidal ideation/attempt common for the American Indian and White youth. In that study, although the American Indian youth had a significantly higher prevalence of suicidal thoughts and attempts than the White youth, they had fewer statistically significant risk factors. Since living in a socioeconomically and culturally homogeneous subculture on a reservation is different than living in a more diverse urban environment, it is not unlikely that psychosocial risk factors and types of coping mechanisms may differ between reservation and urban youth. Our goal with the current study was to investigate potential differences. For example, reservation youth have more ready access to cultural traditions and support from extended family that may confer protective benefits on suicide risk (94, 113), while American Indian youth who live in urban areas are in an environment where they are in the minority, where stressors such as discrimination may increase suicide risk (113).

Our hypothesis was that cultural differences (e.g., diminished social support from extended family and limited access to protective influences of cultural practices and ethnic identity development) (413) would put urban residing youth at risk for lower sense of belonging

(191) that would in turn place them more at risk for either suicidal ideation or suicide attempts than the reservation youth. Based on research showing that boys and girls differ developmentally with boys consistently taking more risks than girls (414) and that coping strategies are often gender-based (38, 39), we also hypothesized gender differences in risk behaviors and psychosocial factors that are associated with suicidal ideation and attempts.

3.3. Methods

3.3.1. Participants

Participants were a volunteer sample of American Indian high school students from Montana reservation ($n = 3748$) and urban ($n = 2669$) schools who agreed to take the Youth Risk Behavior Survey (YRBS) to provide an overview of risk factors for American Indian youth. Montana is unique in that the state Office of Public Instruction invites all schools with a large population of American Indian students to participate in the volunteer sample of the YRBS administration. This allows for a comparison of American Indian students in schools that are located (1) wholly or partially within or that share a border with Montana reservations and (2) in more “urban” areas (i.e., off-reservation schools situated entirely outside reservations). Many of these off-reservation schools are located in areas with populations ranging from 75,000–160,000.

Across the US overall, about 60% of American Indians live in urban areas. Montana differs in that a higher percentage of American Indians live on reservations (60%); while about 40% live in urban areas (415). About 17% ($N = 30$) of the 178 Montana school districts are located on or near a reservation. Of these, about 70% ($N = 21$) participated in the volunteer sample YRBS during each year of the study time-period (2003-2011). Schools on or near a reservation participated at about the same proportion as the more urban schools ($N = 104$). There were about 40% more participants from reservation than urban schools. About 9% of the urban youth attended alternative schools for those more at-risk of dropping out (416). For the present cross-sectional survey analyses, data for American Indian (self-identified) reservation girls ($n = 1860$) and boys ($n = 1888$) and American Indian urban girls ($n = 1284$) and boys ($n = 1385$) in grades 9-12 were extracted from this unique YRBS sample for the five combined odd years from 2003-2011 ($N = 6417$).

3.3.2. Outcome Measures

Two dependent variables were used in the analyses: suicidal ideation and suicide attempts. Suicidal ideation consisted of a positive response to at least one of the following: “*During the past 12 months, did you ever seriously consider attempting suicide?*” (yes; no) or “*During the past 12 months, did you ever make a plan about how you would attempt suicide?*” (yes; no) and a negative response to attempting suicide. Suicide attempts consisted of a positive response to “*During the past 12 months, how many times did you actually attempt suicide?*” (yes = 1 or more times; no = 0 times). Cases were removed from the analyses when no response was provided for suicidal ideation ($n = 32$; 0.5%) or suicide attempts ($n = 116$; 1.8%).

3.3.3. Risk Factor Cluster Determination

Because many of the individual risk factors in the YRBS are similar in content and we did not want to bias the analyses by subjectively grouping them, we did cluster analyses to combine them into more meaningful risk factor clusters, as well as to reduce model complexity and the risk of multicollinearity. Variable clustering is a widely accepted statistical method used to reduce the dimensionality of prediction models by grouping similar items. The cluster analyses were done with the non-hierarchical version of Proc Varclus using partitive clustering with the default 0.7 eigenvalue threshold to split the clusters (396). It uses an iterative process to create non-overlapping groups of variables that are correlated within a cluster and uncorrelated with variables in other clusters. Because changes had been made to the YRBS over the study time-period, we only included variables that were used during all five years of data collection. Variables of interest remained unchanged during the study period. Nine clusters were selected: (1) alcohol, tobacco, and marijuana use (during past 30 days: current and binge drinking, riding with someone who had been drinking, driving while drinking, tobacco use, marijuana use); (2) inhalant drug use (cocaine [ever, past 30 days], methamphetamines [ever]); (3) injection drug use (ever use: heroin, steroids, needle drugs); (4) early risk-taking behavior (smoking cigarettes, drinking alcohol, using marijuana, having sex by age 12 or under); (5) lack of school safety (feeling unsafe [past 30 days], or threatened [past 12 months]) at school; (6) partner victimization (past 12 months dating violence, ever sexually assaulted); (7) risky sexual behaviors (more than 4 sex partners [lifetime], more than 1 sex partner [past 3 months], alcohol/drug use and/or no condom use before last sexual intercourse); (8) unhealthy weight control (past 30 days: fasting, taking diet pills, purging to lose weight); and, (9) weapon carrying (past 30 days: carried a weapon and/or a gun). Because each cluster contains a varying

number of risk factors, the mean for each cluster was used in the analyses to scale for consistency. We also examined sadness/hopelessness (feeling sad or hopeless every day for 2 weeks or more during the past 12 months), the only mental health variable available in the dataset. This served as our proxy for depression, a well-known suicide risk factor (11, 121). The variables were coded in the direction of high risk. Less than 1.5% of responses were missing for each of the independent variable clusters, so imputation was not necessary and these cases were treated as missing.

3.3.4. Statistical Analyses

Analyses of suicidal ideation and suicide attempts were stratified by school location (reservation or urban) as well as by gender, because girls think about and attempt suicide more often than boys (82, 92). Simple frequencies were calculated to determine reservation/urban and gender-specific prevalence estimates of risk factor clusters. These were calculated as the proportion of the total responses that were affirmative. Chi-square tests of association were conducted to determine significant reservation/urban between-group differences in boys and girls. To account for multiple comparisons, Bonferroni corrections were used so differences in the estimates were considered statistically significant if they reached the $p < .004$ level or lower. Logistic regression analyses (forward selection) were calculated for suicidal ideation and suicide attempts separately. Odds ratios (with 95% CI) were adjusted for age and all other model risk factors.

Following their code of regulations, all aspects of the project received approval from the Rocky Mountain Tribal Institutional Review Board located in Billings, Montana.

3.4. Results

3.4.1. Descriptive Statistics

There were no significant differences in the prevalence of suicidal ideation or attempts by location for girls or boys. However, the reservation girls reported significantly less sadness/hopelessness (40.4%; $p < .0001$), injection drug use (3.2%; $p < .0001$), partner victimization (13.4%; $p < .0001$), and weapon carrying (6.1%; $p < .0001$) than the urban girls. In contrast, they reported more alcohol/tobacco/marijuana use (41.9%; $p < .0001$) compared to the urban girls. Like the reservation girls, reservation boys were also less likely than the urban boys to carry weapons (22.1%; $p < .0001$) or inject drugs (3.9%; $p = .0004$). However, they were

more likely than urban boys to report alcohol/tobacco/marijuana use (39.1%; $p = .0030$) and risky sexual behaviors (31.1%; $p < .0001$) (Appendix B; Table 1).

3.4.2. Risk Factors for Suicidal Ideation in Girls

Appendix B; Table 2 shows that for both reservation and urban girls, sadness/hopelessness and partner victimization were statistically significant risk factors associated with suicidal ideation. However, in reservation but not urban girls, unhealthy weight control (OR = 1.80 [1.07, 3.02]) was also a risk factor for ideation. Inhalant drug use (OR = 0.73 [0.54, 0.98]) showed an inverse relation with ideation that was found in reservation girls only.

3.4.3. Risk Factors for Suicidal Ideation in Boys

Sadness/hopelessness was the strongest risk factor for ideation for both boys and girls. Sadness/hopelessness was positively and significantly associated with ideation in reservation (OR = 3.83 [2.78, 5.27]) and urban (OR = 5.34 [3.77, 7.56]) boys (Appendix B; Table 3). But again, reservation boys had more significant risk factors associated with suicidal ideation than the urban boys. Although reservation boys were less inclined to carry weapons than urban boys, for those who did, weapon carrying (OR = 1.19 [1.03, 1.37]) was associated significantly with suicidal ideation. Weapon carrying was not associated with suicidal ideation in urban boys. Early risk-taking behaviors (OR = 1.74 [1.02, 2.99]) and partner victimization (OR = 2.22 [1.30, 3.78]) were also significantly associated with suicidal ideation in reservation but not urban boys.

3.4.4. Risk Factors for Suicide Attempts in Girls

The models show that the profiles of reservation and urban girls were very similar with respect to suicide attempts (Appendix B; Table 4). The majority of the risk clusters were positively and statistically significant correlates for suicide attempts in girls regardless of location. In addition to sadness/hopelessness, common statistically significant risk factors for suicide attempts for these girls included partner victimization and lack of school safety, as well as unhealthy weight control, early risk-taking, and weapon carrying. The only notable difference by location was that inhalant drug use (OR = 1.39 [1.07, 1.82]) was significantly associated with suicide attempts in urban girls only.

3.4.5. Risk Factors for Suicide Attempts in Boys

In contrast to the girls, urban and reservation boys showed clearly different profiles for suicide attempts (Appendix B; Table 5). In reservation boys, only two risk factors were

significantly associated with suicide attempts: sadness/hopelessness (OR = 2.75 [2.02, 3.74]) and lack of school safety (OR = 1.26 [1.05, 1.51]). In urban boys, on the other hand, in addition to sadness/hopelessness (OR = 2.03 [1.44, 2.85]) and lack of school safety (OR = 1.20 [1.01, 1.42]), unhealthy weight control (OR = 3.05 [1.53, 5.92]), early risk-taking behavior (OR = 1.96 [1.14, 3.36]), and partner victimization (OR = 1.81 [1.06, 3.10]) were significantly associated with attempts. Thus, risk factors associated with suicide attempts in urban boys were similar to those in girls.

3.5. Discussion

We found no significant difference in the prevalence of suicidal ideation or attempts by reservation-urban location for girls or boys. This is in contrast to previous research where reservation youth reported a higher prevalence of ideation and attempts than urban youth (99). Consistent with our hypotheses, the study findings show variation across gender profiles in risk behaviors and psychosocial factors associated with suicidal ideation and attempts, as well as differences across the reservation-urban settings. A finding of interest is that reservation girls and boys reported less sadness/hopelessness than their urban counterparts, which partially supports our original hypothesis that urban youth would be more isolated. The question is whether social support or other cohesive cultural factors contribute to a smaller prevalence of sadness/hopelessness in reservation youth. Because sadness/hopelessness was significantly associated with both ideation and attempts in these data, this finding indicates that further research in this area is warranted.

Although the youth reported using substances, only inhalant drug use was significantly associated with a study outcome (suicide attempts) and that was for urban girls only. However, it is puzzling that inhalant drug use showed an inverse relation with ideation for reservation girls. We found no significant difference in inhalant use between reservation and urban location, but previous research in this population found significantly higher levels of inhalant drug use in American Indian girls and boys, including methamphetamines, compared to their White counterparts (412). This is consistent with the literature (80, 417). Methamphetamine use is an important public health problem with wide-ranging implications for tribal communities (418-422). More research is needed to understand its link with suicidal behaviors. Overall, substances may serve as a way for youth to cope with stress or violence in their lives.

Reservation girls also were less likely to carry a weapon or to have experienced partner victimization than urban girls. Partner victimization was a significant risk factor for both suicidal

ideation and attempts in reservation and urban girls but was inconsistent for boys. From our previous research, we know that significantly more American Indian than White youth report partner victimization and data in the current study show that it was significantly more prevalent among urban than reservation girls (412). Although in the current study we do not know the circumstances surrounding the reported sexual assaults (age of occurrence; perpetrator), research often shows a higher prevalence of child sexual abuse in American Indian youth compared to White youth (423). Regarding the higher prevalence in urban girls, research shows that American Indian girls are highly vulnerable to being lured into sex trafficking in urban settings and are actually targeted for commercial sexual exploitation (424). In addition, American Indian women are 2.5 times more likely to experience sexual violence than women in general with most of reported cases (86%) being perpetrated by non-Native men (425), which may explain why urban girls are even more at-risk than reservation girls.

It is interesting that there was an association between lack of school safety and suicide attempts, but not suicidal ideation, across the youth groups. This may be one indicator of the cumulative effect of multiple stressors on attempting, as research has shown a significant association between the number of risk factors an individual accumulates and their risk for suicide attempts (87). Except for reservation boys, the number of significant risk factors increased from ideation to attempt.

Some form of violence (partner victimization, lack of school safety) was positively and significantly associated with either ideation and/or attempts in almost all groups; coping strategies such as substance use and unhealthy weight control were more indicative of suicide attempts than ideation only. This sheds some light on the progression from ideation to attempts in American Indian youth. Research is beginning to examine this distinction (426-428), but further research is needed to understand which life stressors and/or coping strategies predict the progression from ideation to attempts in American Indian youth.

One study strength was our ability to distinguish between suicidal ideation and attempt. We operationalized ideation as *those who only thought or planned an attempt* rather than including those who also went on to attempt, because most people who think about attempting suicide do not go on to actually make an attempt (429). This has implications for understanding the progression from thinking about to actually attempting suicide. Such an understanding could better inform prevention and intervention in this vulnerable population. Also, few studies have examined risk factors for suicidal behaviors in both reservation and urban settings and to the best of our knowledge none have included both suicidal ideation and attempts. This large

database allowed us to compare risk factors related to both suicidal ideation and suicide attempts in American Indian youth in both reservation and urban settings.

A major limitation is that the data did not allow us to investigate the effect of socioeconomic, structural, family, or cultural factors. This may be the reason for the lack of significant risk factors for attempts in reservation boys. American Indians face high rates of poverty, unemployment, and low educational attainment which have been linked to many poor health outcomes. While poverty has been shown to have an independent association with youth suicidality (11, 116), social fragmentation may play a larger role than poverty (118, 119). Also, many colonization practices disrupted American Indian family structure (31), inhibiting the transmission of factors deemed protective, including language and cultural identity (113, 326), as well as social support from extended kinship networks (94). Important risk factors such as discrimination or out-of-home placement were not included (113, 229). In addition, youth may be reluctant to accurately respond to sensitive topics such as suicidal ideation and attempts or sexual assault; however, the YRBS is anonymous and the percent responding affirmatively to these questions indicates that the likelihood of this bias is low. Other limitations include recall bias related to self-report and collecting data only on youth enrolled in school when data from dropouts could be relevant. In addition, since this is a convenience sample the findings may not fully reflect the populations under study. Also, although many Montana cities meet the Census definition of an urban area, the results may not be generalizable to states with larger metropolitan statistical areas (www.census.gov). Access to health care is also an issue, especially mental health care. Research shows an association between discrimination and unmet mental health care needs in American Indians (171). Although the distribution of Indian Health Service funding allocated for mental health and substance abuse services (7%) is comparable to the health spending in the US overall, per capita expenditures are much less (430, 431).

In conclusion, American Indian youth suicide is costly in terms of the loss of young lives and hope for the future, as well as the disruption it causes families and communities and the related economic costs (432). The results indicate that although the prevalence of suicidal ideation or attempts did not differ for American Indian youth in reservation and urban settings, the risk factors did. Early intervention and prevention that is culturally responsive and meaningful to tribal youth, families, and communities is imperative (433). Future research that focuses on multilevel risk and protective factors is essential for our ability to design meaningful prevention and intervention programs.

CHAPTER 4. TESTING A STRESS-COPING MODEL OF SUICIDE RISK IN A TRIBAL COLLEGE POPULATION

4.1. Abstract

Introduction. American Indian youth and young adults have the highest rates of suicide deaths, non-fatal attempts, and ideation in the US. Available data for American Indian college students show higher suicidal ideation than college students overall. Suicide-related data for tribal college students are not available. The objective of this study was to investigate general and culturally-unique psychosocial risk and protective factors associated with suicide risk in this vulnerable group.

Methods. Through on-line and paper self-administered surveys, we collected information in 2012-2013 from 187 American Indians who were tribal college students in Montana and Wyoming. With these data, we tested a stress-coping model (situated within a cultural-historical context) to determine associations between suicide risk and culturally unique life stress, coping skills, enculturation, cultural values, resilience, and social support. We used logistic regression to calculate odds ratios and 95% confidence intervals.

Results. Study results showed low levels of past year suicide risk, especially past year suicide attempts. Statistically significant (positive) stressors of lifetime suicide risk were adverse childhood experiences, other traumatic events, parenting difficulties, discrimination, and thinking of historical losses. Gratitude, social support, participant boarding school attendance, and higher current income mitigated suicide risk.

Conclusion. Although past 12-month suicidal ideation was similar to American Indian high school students in the same tribal region, past 12-month attempts were remarkably low. The results show important areas for future research, including an in-depth understanding of a potential protective influence of the tribal college environment for suicide attempts. The results also have implications for the development of socioeconomic, structural, family- and culture-based interventions and lend support for the importance of widely used Native-developed interventions, such as *American Indian Life Skills* and *Healthy Relationships*.

4.2. Introduction

American Indian youth and young adults have the highest rates of suicide deaths, non-fatal attempts, and ideation in the US (52, 62, 63). Available data for American Indian college students show higher suicidal ideation than college students overall (388). Distinct differences in risk factors among American Indian college students, as well as potential protective factors within this group, demand further attention in addressing suicidality as a major public health threat. Limited research on suicide has been conducted with American Indian college students and, to our knowledge, no suicide research has been conducted with students attending tribal colleges (88, 388). The tribal college setting offers a unique opportunity to test the effect cultural strengths have on culturally unique, as well as generalized stressors, in the lives of American Indian students. A comprehensive understanding of culturally unique life stressors, cultural buffers, and ways of coping will help to inform effective interventions and reduce suicide-related morbidity and mortality in American Indians.

A stress-coping model of Native health has not been tested; however, a model has been conceptualized (24, 25, 36). Using primary cross-sectional survey data, we tested a stress-coping model (Appendix C; Figure 1) of suicide risk to determine associations between suicide risk and culturally unique life stress, coping skills, enculturation, cultural values, resilience, and social support in American Indian tribal college students in Montana and Wyoming. The model is situated within a cultural-historical context (30-33). The model represents culturally unique and generalized stress-coping and focuses on cultural strengths and values that may serve as stress buffering mechanisms. Limited protective factor research with Native populations shows the importance of focusing on the protective influence of cultural strengths and values, as opposed to a deficit, risk factor based focus (21, 44).

Although depression consistently shows the strongest association with suicide risk (11, 120-123), there are other, potentially modifiable, psychosocial factors for American Indians related to suicide risk, including culturally unique life stressors such as adverse childhood experiences, discrimination, generational out-of-home placement, historical losses, unresolved grief, and parenting difficulties. In the general population, research has shown associations between suicide risk and psychosocial risk factors, including both past and current life stressors (31, 113, 125, 138, 208, 222, 229, 434). Although many risk factors are similar across racial/ethnic groups, higher prevalence estimates are found in American Indian youth and adults (78, 90). This is especially true for childhood adversity and traumatic experiences overall, where

significantly higher estimates have been reported by American Indians compared to the general US population (138).

Perceived discrimination, a current life stressor, has been linked to suicide risk in several populations, including American Indian youth (113, 165, 435), as well as young adults in other minority groups (164). In terms of past stressors, research also shows significantly greater suicide risk among both youth and adults who had *at least one parent or grandparent* attend boarding school compared to non-attende offspring (229). In addition, several generations of American Indian children have been disproportionately placed in foster care or adopted out, almost exclusively with non-Native families (208, 222). This practice continued until relatively recently, despite evidence which shows that removing children from their family has detrimental consequences in forming attachments and cultural identity by interrupting the generational transmission of traditions, values, and parenting skills (31, 48). Out-of-home placement also has been linked to suicide risk in other populations (234, 235). When considering the impact of these and other past traumas, one must also take into account the effects of complicated, unresolved grief, which showed a significant association with suicide risk in a largely white, widowed population (387). In addition, thinking of these and other historical losses has been linked with suicide risk factors in Native youth and adults (178, 232, 246, 248).

Despite many risks, there are potential protective factors for suicidality, such as strong social support (99), high levels of religious commitment/spirituality (166, 310, 325), high self-esteem (113, 267, 315), and constructive coping (35, 381, 383, 436). In addition, research has shown enculturation to be protective for suicidal ideation in American Indian youth (113), including a conversational knowledge of traditional language (326). Strong cultural identity may play a role in developing and maintaining a well-defined concept of self-identity. This is important because maintaining a strong and persistent sense of self through developmental transitions also appears protective against youth suicide (437). Nonetheless, research on the relation between suicide risk and culturally unique stressors and protective factors in the most at-risk age group of American Indians, college students, is non-existent, necessitating further investigation through the application of a culturally tailored stress-coping model.

Based on this culturally informed stress-coping model, the first hypothesis is that higher levels of life stressors (i.e., adverse childhood experiences, discrimination, generational out-of-home placement, unresolved grief, ineffective parenting skills) and poor mental health will be positively associated with suicide risk. The second hypothesis is that higher levels of enculturation, resilience, constructive coping skills, social support, self-esteem, and gratitude will mitigate suicide risk.

4.3. Methods

In line with community-based participatory research principles, the project team consisted of tribal members from the *Planting Seeds of Hope* (PSOH) youth suicide prevention project based at the Rocky Mountain Tribal Leaders Council (RMTLC). All procedures were established in collaboration with the local PSOH project team. Following their code of regulations, this project received approval from the Rocky Mountain Tribal Institutional Review Board (RMTIRB) located in Billings, Montana. According to the RMTIRB code of regulations, the study data are the property of the participating tribes under the protection of the RMTLC. To protect confidentiality, no names, tribal affiliations, or tribal colleges have been identified. The study results are in aggregate form, that is, not tribal college- or reservation-specific. Where applicable, the project also was approved by reservation- or tribal college-based IRBs; the remaining participating tribal colleges provided letters of support to attest to their approval. The project also was reviewed and approved by the West Virginia University IRB.

4.3.1. Participants and Population

Participants were a volunteer sample of American Indian (self-identified) tribal college students from Montana and Wyoming and were recruited by PSOH research team members, in cooperation with administrators at each individual school. Each school was provided with a tailored recruitment flyer (Appendix C). Inclusion criteria included Montana-Wyoming tribal college students ages 18 years and older who self-identified as American Indian.

A majority of the American Indian college students in these states attend tribal colleges (63%) compared to 7% nationwide. Additionally, seven (19%) of the nation's 36 accredited tribal colleges are located in this area (221), serving approximately 2700 American Indian students during the study time-period (Fall 2012; www.nces.ed.gov). Nationwide, about half of the tribal college students are over the age of 24 years and approximately 42% are men. The tribal colleges are all located on reservations and most only offer two year degrees.

4.3.2. Procedures

The survey (Appendix C) consisted of established epidemiologic measures (details are below) complemented with additional questions informed by focus group data collected in the same tribal area (March-August 2012) by the Primary Investigator (PI) and PSOH staff (26), as well as through extensive consultation with PSOH and other RMTLC staff. Online survey software (www.qualtrics.com) was used to develop the web-based survey. Access to data is

protected by password and meets federal Health Insurance Portability and Accountability Act standards. The survey was pilot tested with four American Indian college students from a Montana university. At the request of administration at some of the tribal colleges, a paper survey was added to the online version. Some schools elected to use the on-line or paper survey only; some chose to use both versions.

To ensure participant concerns related to taking the survey were met, participants who reported symptoms of depression, anxiety, posttraumatic stress disorder (PTSD), or suicidal thoughts or behaviors were encouraged to talk to a tribal society member or tribal college counselor. The tribal society members and college counselors were available before, during, and up to two weeks after taking the survey. The tribal society members were given an honorarium for their services.

4.3.2.1. Incentives and Sharing of Results

Upon completion of the survey, participants were given the option of having their name included in an incentive drawing. If they responded yes, the on-line survey participants were sent to a second (unlinked) survey to provide their contact information. Participants who completed the paper survey and wanted to be in the incentive drawing provided their contact information before leaving the classroom or computer lab. The original proposal allowed for a drawing for one \$150 item per school. However, some schools chose to have two winners of \$75 gift cards, which were purchased locally. Funds remaining at the end of the grant period were used to provide additional gift cards for participants.

Participants were also given the option to provide contact information at the end of the survey in order to receive study results, if desired. All contact information was stored separately from the data to ensure confidentiality. A tribal IRB-approved summary of aggregate results has been provided to participants and tribal stakeholders. In addition, de-identified datasets were provided to participating tribal colleges, where requested. This project was funded through the Center for Mental Health Services (CMHS) and the Substance Abuse and Mental Health Services Administration (SAMHSA) (Award #SM57380-01) and through pre-doctoral dissertation funding through the Ruth Landes Memorial Research Fund (Award #1005521R).

4.3.2.2. Consent Process

Although actual documentation of consent is not possible with on-line surveys, participants were not able to start the survey without attesting that they had read and

understood the study description and that they agreed to participate. A standard in-person consent process was used for participants who opted for the paper survey.

4.3.2.3. Data Collection

Data collection took place during the fall 2012 through fall 2013 semesters. Although 376 students started the survey, the number of completed surveys was 338, with the difference due to internet access issues, loss of interest, lack of information on American Indian identity, and non-Native or non-tribal college students completing the survey. In addition, an error was made in the skip pattern for the *ever attempt suicide* question with the on-line survey. Participants who answered *yes* to the *ever attempt suicide* question were taken to the next set of survey questions; participants who answered *no* to the *ever attempt suicide* question were taken to the end of the survey. The skip pattern error was rectified; however, the error had affected 151 surveys thereby lowering the current analytic sample to 187 participants. In addition, important measures were missing from the participant data affected by the skip pattern error, including mental health, lifetime traumatic events, and gratitude. Chi-square tests were run and there were no significant differences in demographic characteristics between the cases that were and were not affected by the skip pattern error, therefore, the analytic sample is still representative of the sample as a whole. Of the 187 participants in the analytic sample, 37.4% ($n = 70$) completed on-line surveys and 62.6% ($n = 117$) completed paper surveys. Chi-square tests found no significant difference in key demographics between the on-line and paper cases. Response rates ranged from approximately 3% to 22% across the participating tribal colleges. Student population for semester of participation was obtained from school administrators.

4.3.3. Measures

Total scores were positively associated with the name of the scale, for example, a high score on the stress scale equaled high stress; a high score on the social support scale equaled high support. Where possible, measures were selected that had been validated in American Indian populations.

4.3.3.1. Outcome Measure

Suicide risk was measured with an 11-item dichotomized version of the Suicidal Ideation Questionnaire that had been culturally adapted for the American Indian Services, Utilization, Psychiatric Epidemiology, Risk and Protective Factors Project (AI-SUPERPFP) project (121, 137, 438). A similar dichotomized scale showed good convergent validity with commonly used

suicidality measures using a Likert scale format (439). Suicide risk scores ranged from 0 to 11 ($M = 2.12$, $SD = 2.51$, Cronbach's $\alpha = .82$).

4.3.3.2. Demographics

Demographic covariates used in the analyses included commonly used and culturally relevant control variables: gender, age group, current annual household income, mother's education, and childhood home. We controlled for age and gender, because coping strategies are often age- and gender-based (37-39). Culture also is an important factor in the stress-coping process and may affect the types of stress experienced, their appraisal, and preferred and available coping strategies (40). Childhood home (whether raised on or off the reservation) served as a proxy for exposure to cultural influences.

4.3.3.3. Generational Out-of-Home Placement Index

The generational out-of-home placement index was assessed by a sum of Yes responses for two generations of boarding school attendance (parents, grandparents) and three generations of foster care/adoption (participant, parents, grandparents). Because participant boarding school attendance showed a significant inverse association with suicide risk in bivariate models, it was entered into the multiple variable models separately rather than as part of the generational summed index. The maximum possible score, based on total number of generational out-of-home placements, was 13 with a minimum baseline score of zero for no placements.

4.3.3.4. Adverse Childhood Experiences (ACE)

The childhood adversity measure was an adaptation of the Adverse Childhood Experiences study measure (131), using results from previously conducted focus groups (26). Six dimensions of childhood adversity (emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, childhood household dysfunction) were examined for a sum of Yes responses for a cumulative ACE exposure score ranging from 0-16 ($M = 5.09$, $SD = 3.46$, Cronbach's $\alpha = .80$). *Emotional and physical abuse** included a Yes response to whether caregiver (mother/female; father/male) was: (1) verbally abusive and/or (2) physically violent or abusive to participant. *Emotional neglect** was determined by a Yes response to: (1) not having

*Likert scales responses recoded to never experiencing the adversity=0 and any level of experience=1.

emotional needs met and/or (2) participant feeling like they were a parent to their parent. *Sexual abuse* included a Yes response to: (1) ever being raped or being forced to have sex and/or (2) ever being touched or made to touch someone else in a sexual way by force. *Physical neglect** included three questions regarding not having enough food to eat, enough clothes, or a decent place to live when growing up. *Childhood household dysfunction* included four queries (Yes, No) regarding childhood situations: lived with someone who had a problem with drugs or alcohol or a mental problem; parents divorced or separated; and, mother was treated violently.

4.3.3.5. Traumatic Events Inventory

In addition to the ACE score, a summed score for a traumatic events inventory (not including ACE) also was used with scores ranging from 0-24 ($M = 5.73$, $SD = 4.11$, Cronbach's $\alpha = .82$). This list was adapted from the AI-SUPERPFP study traumatic events list using input from the local project team (9): assaultive violence including interpersonal events (being raped or molested, physical abuse by a spouse or someone else, being robbed or mugged); non-interpersonal events (being in a disaster, a life-threatening accident, direct combat experience, witnessing violence); someone close to participant in a life threatening situation, raped or sexually abused, committed suicide, murdered, or died in a car crash; loss of mother or father; and other (open-ended) traumatic events.

4.3.3.6. Parenting

The parental control subscale from the Measure of Parenting Style Scale was used to assess perceived parenting skills and included questions related to the caregiver being overprotective, overcontrolling, critical, or making participant feel guilty during their first 16 years (440). To avoid multicollinearity, we elected to only use the control subscale, since the other subscales (indifference, abuse) overlapped with the ACE measures. Because there were more missing data with the father/male caregiver responses, we used the mother/female caregiver score only. Response options ranged from *not true at all* to *extremely true*. The mother's parental control subscale scores ranged from 5 to 20 ($M = 12.77$, $SD = 2.86$, Cronbach's $\alpha = .57$).

*Likert scales responses recoded to never experiencing the adversity=0 and any level of experience=1.

4.3.3.7. Discrimination

The Everyday Discrimination measure was used to assess the occurrence and frequency of respondents' perception of unfair treatment from routine and relatively minor day-to-day interpersonal experiences (441). Response options for each question ranged from 1 to 6, with 1 indicating *almost every day* and 6 indicating *never*. The summed reverse-coded responses were used to create the everyday discrimination score with scores ranging from 9 to 54 ($M = 23.54$, $SD = 10.97$, Cronbach's $\alpha = .91$).

4.3.3.8. Perceived Stress

Perceived stress was measured with Cohen's 10-item Perceived Stress Scale (PSS) (442). The 5-point scale ranged from *never* to *very often* with scores ranging from 10 to 50 ($M = 28.27$, $SD = 6.51$, Cronbach's $\alpha = .82$).

4.3.3.9. Historical Loss

Historical loss perceptions were assessed with a 12-item measure asking how often the participant thought about (*never* to *several times a day*) a series of historical losses (200). Scores ranged from 12 to 72 ($M = 35.94$, $SD = 14.44$, Cronbach's $\alpha = .94$).

4.3.3.10. Depression

Depressive symptoms were measured using the 20-item Center for Epidemiologic Studies Depression Scale (CESD) (443-446). Responses ranged from 1 (*rarely or none of the time*) to 4 (*most or all of the time*) for a scale range of 20 to 80 ($M = 36.48$, $SD = 10.54$, Cronbach's $\alpha = .89$).

4.3.3.11. Anxiety

Generalized anxiety symptoms (past 6 months) were measured with the 7-item Generalized Anxiety Disorder (GAD-7) scale. Responses ranged from *not at all* to *nearly every day* for a scale range of 7 to 28 ($M = 12.01$, $SD = 5.27$, Cronbach's $\alpha = .94$) (447).

4.3.3.12. Posttraumatic Stress Disorder (PTSD)

PTSD symptoms were measured with the 8-item PTSD-8 scale. Responses ranged from *not at all* to *most of the time* for a scale range of 8 to 32 ($M = 15.12$, $SD = 7.11$, Cronbach's $\alpha = .94$) (448).

4.3.3.13. Grief

Grief was measured using the UCLA Grief Screening Scale, an 11-item self-report inventory of past month grief symptoms with responses ranging from *not at all* to *most of the time* (387). Scale scores were summed with scores ranging from 12 to 60 ($M = 32.54$, $SD = 11.60$, Cronbach's $\alpha = .92$).

4.3.3.14. Social Support

Social support was assessed with Sarason's 6-item Social Support Questionnaire (449). Participants were asked to check all those that they could count on for help or support regarding being dependable, helping you relax, accepting you, caring about you, helping you feel better, and consoling you. The options, developed in consultation with the PSOH project team, included family members and other relatives, friends, clergy, spiritual elders, God/Spiritual Being, other, and no one. Scores were summed from 0 to 9 for each item for a scale range of 0 to 54 ($M = 15.65$, $SD = 10.40$, Cronbach's $\alpha = .96$). Missing responses and no one were coded as 0; each checked option was coded as 1.

4.3.3.15. Self-esteem

Self-esteem was measured with the 6-item Rosenberg Self-Esteem Scale validated by the Voices of Indian Teens Project (450). Responses ranged from *strongly agree* to *strongly disagree*. Scale scores ranged from 6-24 ($M = 19.23$; $SD = 3.29$; Cronbach's $\alpha = .81$).

4.3.3.16. Spirituality

Spirituality was assessed using three-items from the AI-SUPERPFP study that asked about importance of (*extremely important* to *not at all important*), time spent on (*every day or almost every day* to *not at all*), and how often one finds comfort or guidance through religious or spiritual practices (*never* to *very often*) (310). Scores ranged from 3 to 15 ($M = 10.92$, $SD = 3.28$, Cronbach's $\alpha = .86$).

4.3.3.17. Resilience

Resilience was measured using Wagnild's 14-item Resilience Scale (RS-14) (451, 452). Responses ranged from *strongly disagree* to *strongly agree*. The RS-14 scores range from 14 to 98 ($M = 80.43$, $SD = 16.41$, Cronbach's $\alpha = .97$).

4.3.3.18. Gratitude

Gratitude was measured with the 6-item Gratitude Questionnaire (range = 6-42; $M = 34.87$, $SD = 6.61$, Cronbach's $\alpha = .76$) (453). Responses ranged from *strongly disagree* to *strongly agree*.

4.3.3.19. American Indian Cultural Identity

Cultural identity was used as a measure of enculturation using the American Indian subscale of the 8-item Bi-Ethnic Identity Scale (368, 454). Responses ranged from *not at all* to *very much* or from *not at all important* to *extremely important*. Scores ranged from 8 to 40 ($M = 24.83$, $SD = 7.53$, Cronbach's $\alpha = .89$).

4.3.3.20. Coping

Coping was measured with the Brief COPE, a well-established abridged version of the COPE Inventory (455). The 28-item (14 subscale) Brief COPE measures various constructive and non-constructive coping dimensions. All 14 subscales, or a select number of subscales, can be used. In addition, variable reduction techniques, such as principal component analyses (PCA), have been used to reduce the dimensionality of the subscales (456). In the current study, constraining the PCA to retain two factors reduced the dimensionality of the 14 subscales to constructive and non-constructive coping for a more parsimonious model. Scores ranged from 16 to 64 and 12 to 48, respectively, for the constructive ($M = 44.59$, $SD = 9.59$, Cronbach's $\alpha = .88$) and non-constructive ($M = 23.43$, $SD = 6.18$, Cronbach's $\alpha = .80$) coping factors. Responses ranged from *I don't do this at all* to *I do this a lot*.

4.3.3.21. Participant Reaction to Participating

Because of the sensitive nature of the survey and the history of research abuses in this population (210), three questions were included at the end of the survey to assess participant reactions to participating, including: feeling upset, thought worth the time, and felt free to skip questions or stop at any time (457). Responses ranged from *not at all* to *a great deal*.

4.3.4. Statistical Analyses

Analyses were conducted with SAS Version 9.3. First, simple frequencies were calculated for suicide risk and socio-demographic variables. Then, means, standard deviations, and Cronbach's alphas were calculated for each individual scale. Next, bivariate regression

models were used to calculate odds ratios and 95% confidence intervals using a suicide risk score proportion (suicide risk score/11) as the outcome variable.

Given the multitude and complexity of potential factors that may increase or mitigate suicide risk as compared with the limited sample size, steps were taken to determine the most parsimonious models for examining the impact of the independent variables on the overall suicide risk score, including: (1) running multicollinearity diagnostics to check for redundancy in the independent variables, (2) conducting subscale-level principal component analyses (varimax rotation) to reduce the dimensionality of the Brief COPE subscales, and (3) running a model using the three mental health scales to determine which one was most strongly and significantly associated with suicide risk for inclusion. Then, multiple variable logistic regression models were run using the suicide risk score proportion as the dependent variable. Non-statistically significant factors were removed for a more parsimonious final model.

The tolerance scores for the selected independent variables in these models were 0.46 or higher, so multicollinearity was not a concern (458). Depression was selected as the mental health scale to include in the model, because the strength of association between depressive symptoms and suicidality was the strongest of the three mental health scales (depression (OR = 2.30 [1.74, 3.04]), anxiety (OR = 1.21 [0.99, 1.47]), and PTSD (OR = 1.26 [1.09, 1.46]) symptoms), and depressive symptoms are consistently one of the strongest risk factors for suicidality (11, 120-123).

Within the first component of the stress-coping framework, multiple variable models were run for hypothesized stressors (adverse childhood experiences, traumatic events, discrimination, perceived stress, historical loss, generational out-of-home placement, grief, parental control, and depressive symptoms). For the second component of the stress-coping model, multiple variable models were run for hypothesized protective factors (boarding school attendance, social support, self-esteem, spirituality, resilience, gratitude, enculturation, and constructive coping skills).

Last, full stress-coping models were run with and without depressive symptoms and then with commonly used and culturally relevant control variables (age group, gender, mother's education, current household income, where participant spent their childhood). There were no significant differences in key demographic characteristics when separated into missing and non-missing samples.

4.4. Results

4.4.1. Prevalence of Suicidality and Suicide Risk Scores

Appendix C; Table 1 provides lifetime and past 12-month prevalence estimates for suicidal thoughts and behaviors and suicide risk scores. Results show that 50.8% ($n = 95$) of the participants reported no suicidal thoughts or behaviors. For lifetime suicidal thoughts and behaviors, 51.7% ($n = 89$) of the participants reported ideation; 32.4% ($n = 60$) reported planning an attempt; 26.0% ($n = 46$) reported telling someone they were thinking of attempting suicide; and, 26.9% ($n = 49$) reported at least one attempt in their lifetime. Of those who reported a lifetime attempt, 12.1% ($n = 22$) reported attempting more than one time. Compared to lifetime suicidal thoughts and behaviors, about half as many participants reported thinking about attempting in the past 12 months ($n = 47$; 26.9%); however, planning, telling, and actually attempting were much lower. Suicide risk scores ranged from 0-10 with a mean score of 2.12 ($SD = 2.51$). No one received the maximum score of 11.

4.4.2. Socio-Demographic Characteristics

Appendix C; Table 2 presents prevalence estimates, bivariate odds ratios, and 95% confidence intervals (CI) for socio-demographic characteristics. Participants in the current analyses included 119 (64.7%) women and 65 (35.3%) men. About half ($n = 102$; 54.6%) were aged 18-24 and 85 (45.5%) were 25 years of age or older. About 55% ($n = 98$) had incomes less than \$10,000/year; 40.1% ($n = 75$) reported that their mother had a high school degree or less. A majority of the participants ($n = 159$; 85.0%) reported they spent most of their childhood on or near a reservation. Of the control variables, only higher current household income was significantly associated (inversely) with suicide risk ($OR = 0.87$ [0.83, 0.92]).

Fourteen percent ($n = 26$) of the participants reported attending boarding school; 15.1% ($n = 28$) and 9.4% ($n = 18$) of them reported being placed in foster care or adopted, respectively. Twenty-seven percent ($n = 50$) of the participants reported that their mother had attended boarding school and 11.8% ($n = 22$) reported that she had been placed in foster care or adopted. Compared to their mothers, a smaller percent of the participants reported that their fathers (18.1%; $n = 33$) had gone to boarding school, while a similar percent reported their fathers were placed outside the home (9.7%; $n = 18$).

Unexpectedly, participant boarding school attendance ($OR = 0.67$ [0.47, 0.95]) was inversely associated with suicide risk. In contrast, both participant foster care ($OR = 1.44$ [1.08, 1.92]) and adoption ($OR = 1.57$ [1.11, 2.23]) were significantly associated with suicide risk.

Results varied for their parents with father's boarding school attendance (OR = 1.34 [1.02, 1.76]) and mother's foster care/adoption (OR = 1.62 [1.19, 2.21]) being significantly associated with participant suicide risk. Neither grandparent's boarding school attendance nor foster care/adoption were significantly associated with participant's suicide risk. However, there was a significant association between participant suicide risk and generational out-of-home placement (OR = 1.06 [1.01, 1.13]).

4.4.3. Scale Psychometrics and Bivariate Models

Appendix C; Table 3 provides information on scales and indices (range, mean, standard deviation, Cronbach's α) used in the analyses, bivariate odds ratios, and 95% CIs for the scales and indices. The strongest statistically significant positive associations with suicide risk were adverse childhood experiences (OR = 9.32 [5.71, 15.23]), lifetime traumatic events (OR = 11.82 [6.53, 21.38]), depressive symptoms (OR = 3.36 [2.76, 4.10]), perceived stress (OR = 2.19 [1.83, 2.62]), and anxiety symptoms (OR = 2.01 [1.83, 2.42]). Three scales were significantly and inversely associated with suicide risk in the bivariate models: self-esteem (OR = 0.46 [0.37, 0.56]), gratitude (OR = 0.70 [0.64, 0.78]), and social support (OR = 0.90 [0.84, 0.96]).

Appendix C; Table 3 also shows results for bivariate odds ratios and 95% CI for individual coping subscales and the two coping factors. Several of the individual subscales were positively and significantly associated with suicide risk (active, humor, religious/spiritual, self-distraction, denial, venting, substance use, disengagement, self-blame). The two support subscales were significantly and inversely associated with suicide risk. For the two coping factors, non-constructive coping was a statistically significant (positive) risk factor for suicide risk (OR = 3.22 [2.61, 3.99]); constructive coping was not.

4.4.3. Principal Component Factor Loadings for Brief COPE Subscales

Appendix C; Table 4 provides factor loadings for the Brief COPE subscale principal component analysis, after being constrained to retain two factors suggesting constructive and non-constructive coping. Except for humor, which loaded on both factors (.38; .48), the remaining subscales loaded more strongly on one factor than the other. Since the strongest loading for humor was for the non-constructive coping factor, humor was included in the non-constructive coping factor. In addition, when the PCA was run with the 28 individual items (as opposed to the 14 subscales), the two humor items loaded more strongly on the non-constructive coping factor. For brevity, Appendix C; Table 4 displays factor loadings for the 14 subscales only.

4.4.5. Multiple Variable Stressor Models

Appendix C; Table 5 presents results for multiple variable models for the first component of the stress-coping model for suicide risk: the hypothesized stressors. Childhood adversity (ACE: OR = 3.91 [2.11, 7.22]) and lifetime traumatic events (OR = 2.23 [1.01, 4.93]) showed the strongest associations for suicide risk, even after depressive symptoms were added to the model (Appendix C; Table 5, Model 4). In Models 1 and 2 (Appendix C; Table 5), mother's parental control, discrimination, perceived stress, and thinking about historical losses also were positively and significantly associated with suicide risk. However, perceived stress lost significance after depressive symptoms were added to the model (Appendix C; Table 5, Model 3). There was a significant inverse association between generational out-of-home placement and suicide risk that lost significance when depressive symptoms were added to the model (Model 3).

4.4.6. Multiple Variable Protective Factor Models

Appendix C; Table 6 presents results for multiple variable models for the second component of the stress-coping model for suicide risk: the hypothesized protective factors. Except for American Indian identity, all of the factors in Model 1 (Appendix C; Table 6), including participant boarding school attendance, were statistically significantly and inversely associated with suicide risk. However, contrary to the hypothesis, two factors were positively, rather than inversely, associated with suicide risk: spirituality (OR = 1.36 [1.20, 1.54]) and resilience (OR = 1.46 [1.27, 1.69]). As with the bivariate models, non-constructive coping (OR = 1.85 [1.42, 2.49]) was positively and statistically significantly associated with suicide risk; constructive coping was not significantly associated with suicide risk (Appendix C; Table 6, Model 2).

4.4.7. Full Stress-Coping Models

Results for the full stress-coping models are presented in Appendix C; Table 7. Discrimination lost significance when the hypothesized protective factors were added to the model (Appendix C; Table 7, Model 1); no other stressors were affected. However, when depressive symptoms were added to the model (Appendix C; Table 7, Model 2), thinking about historical losses and self-esteem also lost significance. When the coping factors were added to the model, depressive symptoms lost significance (Appendix C; Table 7, Model 4); the traumatic events inventory also lost significance.

Five control variables were added to the full stress-coping model separately: gender, age group, current household income, mother's education level, and childhood home. Although

gender (Appendix C; Table 8, Model 1) was not a significant factor for suicide risk, the traumatic events inventory, generational out-of-home placement, and resilience lost significance when the full stress-coping model was controlled for gender. As expected, the higher age group was inversely associated with suicide risk in the full stress-coping model (Appendix C; Table 8, Model 2), although, except for resilience, its addition to the model did not affect the independent variables. As in the bivariate models, higher current income was inversely and significantly associated with suicide risk in the full stress-coping model (Appendix C; Table 8, Model 3). In addition, resilience lost significance when the model was controlled for current income. When the model was controlled for mother's education level (Appendix C; Table 8, Model 4), thinking about historical losses regained the significance it had lost when depressive symptoms were added to the stress-coping model (Table 7). Mother's education level also appears to influence generational out-of-home placement and resilience as correlates of suicide risk. Childhood home (Appendix C; Table 8, Model 5) was not a significant factor in the full model and did not alter the significance of the other independent variables.

4.4.8. Participant Reaction to Participating

Last, results (not shown) for participant reactions to participating in the survey indicate that although 31.5% ($n = 56$) reported that completing the survey made them feel upset (somewhat or a great deal), the majority (88.3%; $n = 159$) reported that completing the survey was worth the time (somewhat or a great deal) and 72.5% ($n = 129$) reported that they felt free to skip questions or to stop at any time (somewhat or a great deal).

4.5. Discussion

The prevalence of past 12-month suicide attempts in this tribal college population was remarkably low. This is in contrast to previous studies in American Indian high school students from the same tribal region (412, 459); however, it is similar to prevalence estimates found in a population-based sample of tribal members from two Northern Plains communities (121). Study findings are consistent with research that shows that, in contrast to White populations, suicide risk decreases with age in American Indian populations (90). However, while prevalence of current attempts was low in this group, current suicidal thoughts were not. In fact, ideation in the tribal college population was comparable to the American Indian high school population data previously mentioned (412, 459). This would suggest the presence of a protective influence in the tribal college population that lessens their risk of progressing from ideation to actually

attempting suicide. This is noteworthy since more than 50% of the tribal college students are in the more at-risk age group. Understanding how the tribal college population differs from the general tribal population may be critical for prevention efforts. However, the protective factor in this population may be the fact that they are attending college. For example, attending college may be an indication of self-continuity, in that these students believe in a future and are creating possibilities for a future by pursuing higher education. Thus the tribal college population may not be representative of this age group as a whole; therefore these results may be conservative estimates of suicide risk for this age group. In addition, the tribal colleges foster cultural knowledge and traditional values, which this research indicates may buffer suicide risk in this population (220). These schools also provide an environment which is conducive for advanced education, which is not always valued in tribal communities (personal communication).

Framed within a stress-coping model, the results show high levels of traumatic adversity and other life stressors that were positively associated with suicide risk with less distinct evidence reflecting the influence of proposed protective factors, cultural buffers, and coping strategies. The data support the first hypothesis that higher levels of life stress and poor mental health would be positively associated with suicide risk, although not all stressors retained statistical significance in the full stress-coping models.

Traumatic adversities, especially adverse childhood experiences (ACE), showed the strongest magnitude of association for suicide risk in the full stress-coping models. While the traumatic events inventory lost significance when the model was controlled for gender, controlling for gender did not affect the significance of ACE as a risk factor for suicide risk and only slightly decreased the strength of association of ACE with suicide risk. The level of traumatic stress reported in this population was considerably higher than general population studies (131, 460).

Early life traumas can increase the risk of exposure to subsequent traumas and may negatively affect development of constructive coping skills, self-esteem, and cultural identity, which in turn may increase suicide risk (125, 126, 129). In addition, childhood traumas often co-occur and cumulative ACE have demonstrated a dose-response relation for many suicide-related risk factors, including an increased risk for depression, substance abuse, and intimate partner violence in American Indians and the general population overall (125, 127, 128, 132, 133, 135, 142, 434, 461-466). Within First Nation adults, research has shown a link between ACE and increased depressive symptoms, especially in the presence of discrimination, poor coping skills, and negative social support (467). Even though early adversity may influence vulnerability to cope with current stressors, increasing constructive coping and addressing

healthy relationships are potential areas for intervention as one moves towards adulthood and later life. For example, ACE have been linked to abusive parenting of one's own children (259).

In Native communities, historical events have radically altered the social structure, including assimilation policies, such as mandatory boarding school attendance and urban relocations, as well as the high levels of Native children currently placed outside the home and exorbitantly high rates of unemployment and incarceration. This social disintegration has disrupted family relationships and kinship structure, inhibiting the generational transmission of language, traditional parenting skills, and cultural practices, thereby weakening the collective conscience deemed important by Durkheim for strong social integration that is protective against suicide risk (28, 29). The kinship structure and collective social structure provided protection for women as well as children; family violence was rare in traditional Native society (468). Changes in parenting style and current high levels of family violence are a reflection of the disrupted attachments (31).

Previous studies have shown that thinking about historical losses was positively associated with alcohol abuse, anger, and symptoms of internalization in adults and depressive symptoms in adolescents (200, 246). It is important to note that when combined with depressive symptoms, these thoughts were not significantly associated with suicide risk in the full stress-coping model in the current study. However, grief had also been removed during model reduction. More research is needed to quantify the connection between thinking about historical losses and grief, especially unresolved grief, which is in line with the historical trauma literature (469).

Current high levels of discrimination reported in this study also are problematic for suicide risk. However, the effect was mitigated when protective factors were added to the model. More research is needed to determine which factors provide the most protection and which types of discrimination are most negatively associated with poor mental health and suicide risk to effectively focus prevention efforts.

Data from the current study partially support the second hypothesis that higher levels of enculturation, resilience, constructive coping skills, social support, self-esteem, and gratitude mitigate suicide risk. This is evident in that not all stressors retained statistical significance in the full stress-coping models, which may be indicative of a buffering effect from some of the proposed protective factors. However, contrary to the second hypothesis, resilience and spirituality were positively, rather than inversely, associated with suicide risk.

Ironically, the high level of childhood and later life adversity in this tribal college population may account for the positive association of resilience with suicide risk. By definition,

resilience increases as a result of successfully adapting to adversity; however, research has shown a quadratic, rather than linear relation, between cumulative adversity and mental health and well-being outcomes (470). It may be that the level of adversity in this population has passed the critical point of successful adaption, where the ability to constructively cope with adversity lessens. More research is needed to determine whether the effect of resilience and ability to cope adaptively vary with level of cumulative adversity, gender, and age group.

Although the protective influence of participant boarding school attendance (as opposed to parent or grandparent attendance) was unexpected, this makes sense in light of education policy changes begun in the 1970s. The institution of the Indian Self-Determination and Education Acts of the 1970s and the Indian Child Protection Act of 1990 allowed tribes to assume more responsibility for their children's education, including stringent background checks for teachers and staff to help protect children. Results from this study indicate that these schools now appear to provide a protective environment against discrimination and abusive home environments (77, 208, 212, 219). This is consistent with Durkheim's social integration and evidenced by research in British Columbia bands that shows that higher levels of cultural continuity, such as markers of self-determination and tribal autonomy, are protective against suicide risk in First Nations youth (28, 29, 212).

If youth suicide is related to disrupted development, it stands to reason that being involved in and identifying with one's culture may be a key protective factor, since culture provides a foundation that gives meaning to life and a way to see oneself moving into the future (316). However, in the current study, American Indian identity was not protective against suicide risk. This may be a result of sample size or older average age in tribal college participants. It also may be more meaningful to focus on specific cultural values, such as gratitude and generosity, as opposed to items that measure level of involvement in American Indian way of life, because gratitude was consistently inversely associated with suicide risk in this study. This may also explain the positive association of spirituality with suicide risk. Perceptions of commitment to or finding comfort or guidance in religion, as with cultural involvement, may be extrinsic measures of an orientation. Whereas gratitude may be an intrinsic, internalized expression of spirituality and cultural values, and therefore may be a more meaningful measure (471). Although more research is needed in this area, gratitude toward God has shown a buffering effect on stress and poor health in a nationwide sample of older adults, especially women (472).

The main strength of the current study is the information gained by testing a stress-coping model of culturally relevant stressors and protective factors in a unique tribal population.

Both elements add to the literature and provide avenues for more in-depth research, as well as implications for intervention development. This is highly innovative, because to our knowledge, a stress-coping model for suicide risk has not been tested in an American Indian population.

The study is not without limitations. The small sample size limited the number of variables that could be included in the models. The results for independent variables in this sample that were statistically significant can be trusted; however, the non-significant variables may be affected by sample size and should be interpreted with caution. The sample size also did not allow for a more in-depth examination of anxiety and PTSD symptoms. In addition, we were unable to stratify by gender. Gender stratification is important for several reasons. Women and men are often exposed to different types of adversity and also appraise and cope with adversity in different ways (38, 39, 138). The study also was limited to one tribal region. Including tribal colleges nation-wide would provide a larger sample for regional, as well as gender, comparisons. Other limitations include recall bias and causal direction limits found with cross-sectional data. Last, mixed-mode data collection may introduce measurement error (473). However, there were no significant differences in key demographic characteristics between the on-line and paper surveys in the analytic sample.

In conclusion, testing a stress-coping model has provided important information on associations between general and culturally relevant stressors and protective factors for suicide risk in this unique tribal college setting. Results highlight the importance of examining both stressors and protective factors. While inclusion of protective factors did not eliminate the influence of childhood adversity, the results have implications for socioeconomic, structural, family, and culture-based intervention development.

The study results also indicate promising areas for future research related to protective factors, including education policy analysis and examination of cultural values, such as gratitude, as well as differentiating between which factors mitigated the effect of discrimination on suicide risk. Future research informed and driven by community identified needs is important to address unanswered questions such as why certain coping strategies were preferred, whether there are gender differences in preference, and if other, perhaps more culturally relevant strategies, should be included in the measure. Because humor loaded as both a constructive and non-constructive coping strategy, it is important for future research to examine the effect of different types of humor on suicide risk in American Indians (474). Community-based approaches also are needed to better understand resilience in American Indian populations. More research is needed in tribal college populations to understand the apparent protective mechanisms at play in their ability to overcome adversity to help reduce morbidity and

mortality reservation-wide. Doing so will promote strong, healthy future generations while informing prevention efforts for this high-risk population.

Chapter 5. Summary of Research

5.1. Summary

Suicidality is a complex phenomenon and a distressing indicator of the mental suffering, disrupted attachments, and social disintegration found in many Native communities (31, 48, 232). Recent research indicates significant downward trends in age-adjusted suicide rates in 10-24 year old persons nationwide, including in American Indian populations where the rates are still the highest of all US racial/ethnic groups (475). Results from this dissertation research provide positive areas for culturally relevant suicide prevention and intervention to continue this downward trend.

The goal of this dissertation research was to examine culturally unique psychosocial risk and protective factors and coping strategies associated with suicidality in American Indian youth and young adults. To accomplish this goal, three interdependent cross-sectional studies were undertaken. The first two studies used secondary data from the Youth Risk Behavior Survey (YRBS) and the third study used primary data from an original survey designed in collaboration with tribal members collected in a unique tribal college setting. The three studies are described in detail in Chapters 2-4. The focus of Chapter 2 (Specific Aim 1; Study 1) was to identify gender-specific individual-level YRBS risk factors associated with suicidal ideation/attempts for American Indian and White Montana high school students using pooled *random sample* YRBS data. The focus of Chapter 3 (Specific Aim 2; Study 2) was to identify gender-specific individual-level YRBS risk factors associated with both suicidal ideation and suicide attempts in American Indian students attending Montana reservation and urban high schools using pooled *volunteer sample* YRBS data. The focus of Chapter 4 (Specific Aim 3; Study 3) was to test a stress-coping model of the relation between life stress, coping skills, enculturation, cultural values, resilience, psychological well-being, social support, and perceived parenting skills on suicide risk in American Indian tribal college students using primary survey data.

Results from the examination of gender-specific risk factors for American Indian and White youth (Specific Aim 1; Chapter 2) confirmed the significantly higher prevalence of suicidal ideation and attempts and depressive symptoms in American Indian girls and boys compared to White boys and girls found in previous research (78, 80, 87). The American Indian youth consistently reported significantly higher levels of adversity (dating violence, sexual assault, feeling unsafe at school) and non-constructive coping (substance use, unhealthy weight control) than the White youth (Appendix A; Table 1). Sadness/hopelessness, the only depressive

symptom available in the YRBS, was the only risk factor that was significantly associated with suicidal ideation/attempts for the American Indian and White girls and boys. In addition to sadness/hopelessness, only one other risk factor was significantly associated with suicidal ideation/attempts for the American Indian girls (unhealthy weight control) and boys (weapon carrying). In contrast, for the White girls and boys, many of the YRBS risk factors showed a significant association with suicidal ideation/attempts (Appendix A; Table 2).

Based on reservation/urban location, data from Specific Aim 2 (Study 2; Chapter 3) revealed no significant differences in prevalence of suicidal ideation and suicide attempts in the reservation/urban locations for either gender (Appendix B; Table 1). However, there were differences in significant risk factors for ideation and attempts (Appendix B; Tables 2-5). The urban girls in this study reported significantly more sadness/hopelessness, partner victimization, injection drug use, and weapon carrying than the reservation girls; the reservation girls reported significantly more alcohol/tobacco/marijuana use than the urban girls. For the boys, significant differences in the prevalence of risk factors were primarily found in type of substance use reported. Results from Study 2 (Chapter 3) also showed gender differences in significant risk factors for suicidal ideation and attempts across the reservation/urban locations with fewer differences noted for girls than boys (Appendix B; Tables 2-5). Sadness/hopelessness (for all the youth) and partner victimization (for all except the urban boys) were significant risk factors for ideation along with some type of coping strategy (for the reservation, but not the urban, youth). The significant risk factors for suicide attempts in the girls were similar, including sadness/hopelessness, victimization (partner violence, lack of school safety), and coping strategies (unhealthy weight control, early risk-taking, weapon carrying). Sadness/hopelessness and lack of school safety were the only common significant risk factors for suicide attempts for the reservation and urban boys and the only two significant risk factors for the reservation boys. For the urban boys, partner victimization, unhealthy weight control, and early risk-taking also were significantly associated with suicide attempts.

Specific Aim 3 (Study 3; Chapter 4) results were based on primary data collected in Montana-Wyoming tribal colleges. An important finding is the low level of past year suicide risk reported in this American Indian (self-identified) tribal college population, in particular, low levels of past year reported suicide attempts (Appendix C; Table 1). Fourteen percent of the participants in this study reported attending boarding school, which showed an unexpected inverse association with suicide risk (Appendix C; Table 2). We looked at two categories of generational out-of-home placement as potential risk factors for suicide risk: boarding school placement and foster care/adoption. In the bivariate models (Appendix C; Table 2), for boarding

school placement, father's boarding school attendance was the only significant risk factor for suicide risk; foster care/adoption was a significant risk factor for suicide risk for the participant and the participant's mother. Grandparent out-of-home placement was not a significant risk factor in the bivariate models. When the two categories were combined across the generations, as expected, there was a significant positive association with suicide risk in the bivariate models; unexpectedly, this association inversed in the stressor models, although the association did not remain significant in the full stress-coping models (Appendix C; Tables 5, 7, and 8).

Within the first component of the stress-coping model, all of the risk factors (stressors) were positively and statistically significantly associated with suicide risk (Appendix C; Table 3). The strongest associations were found for lifetime traumatic events and adverse childhood experiences (ACE), as well as mental health symptoms (depression, anxiety, perceived stress, posttraumatic stress disorder). ACE and lifetime traumatic events remained the most significant risk factors for suicide risk in this tribal college population in the multiple variable stressor (risk factor) models (Appendix C; Table 5). Within the second component of the stress-coping model, the protective factor model (Appendix C; Table 6), participant boarding school attendance, social support, self-esteem, and gratitude were inversely associated with suicide risk; unexpectedly, higher levels of spirituality and resilience were positively associated with suicide risk. As expected, non-constructive coping was positively associated with suicide risk, while constructive coping was not significantly associated with suicide risk.

The full stress-coping models (Appendix C; Table 7) show the potential benefit of protective factors, because depressive symptoms, discrimination, and generational out-of-home placement lost significance after the protective factors were added to the model (Appendix C; Table 7, Model 1 and 2). Thinking about historical losses lost significance when depressive symptoms were added to the model; self-esteem did as well (Appendix C; Table 7, Model 2). Again, loss of significance may be indicative of the limited sample size for the number of independent variables. Participant boarding school attendance, social support, and gratitude were consistently inversely associated with suicide risk across the stress-coping models (Appendix C; Table 7), even after controlling for gender, age, current income, mother's education, and childhood home (Appendix C; Table 8).

5.2. Strengths and Limitations

Two of these studies, using YRBS data, were limited to assessing risk factors. Even though YRBS data are not always culturally relevant for assessing suicide risk in Native youth,

the first two studies confirmed the higher prevalence of suicidality in girls compared to boys and the higher prevalence of suicidality in American Indian youth compared to White youth found in previous research.

Study 2 results showed no significant differences in ideation or attempts across the reservation/urban locations for either gender; however, there were differences in significant risk factors across the reservation/urban locations. Reservation life may confer some protective benefit, especially in terms of the prevalence of sexual assault, i.e., childhood adversity; however, the prevalence of sexual assault reported by reservation youth is still significantly higher than estimates reported by White youth in the same geographic area. Some of the violent victimization may be related to discrimination.

Although limited by the risk factors that the YRBS data allowed us to analyze, the results from the two YRBS studies, in conjunction with the focus group results from the *Planting Seeds of Hope* youth suicide prevention evaluation, provided a foundation for developing the comprehensive and culturally relevant stress-coping survey conducted with the Montana-Wyoming tribal college students.

The tribal college study (Specific Aim 3; Study 3, Chapter 4) was limited by the small sample size. However, use of the culturally relevant model, developed in consultation with tribal members confirmed risk factors not found in YRBS data, such as discrimination, found in other settings and racial/ethnic groups (113, 164-166). These results also add to limited research regarding the value of protective factors and provide important information that is pivotal in designing culturally relevant interventions for suicide prevention within Native populations.

The main strength of the tribal college study (Chapter 4) is testing a stress-coping model of culturally relevant stressors and protective factors in a unique tribal population. Both elements are innovative and address gaps in the literature, thereby providing avenues for more in-depth research, as well as implications for intervention development. This is highly innovative, because to our knowledge, a stress-coping model for suicide risk has not been tested in an American Indian population.

However, the tribal college study is not without limitations. The small sample size limited the number of variables that could be included in the models and did not allow for a more in-depth examination of anxiety and PTSD symptoms. We also were unable to stratify by gender, which may be important for intervention development. A larger, more regionally diverse sample would allow us to examine regional and gender differences in risk and protective factors. The study also was limited by recall bias and causal direction limits found with cross-sectional data.

In conclusion, testing a stress-coping model has provided important information on associations between general and culturally relevant stressors and protective factors for suicide risk in this unique tribal college setting. Results highlight the importance of examining both stressors and protective factors which have implications for socioeconomic, structural, family, and culture-based intervention development.

5.3. Future Research

The dissertation results indicate promising areas for future research. For example, through this seven-year process we found that community-based approaches are needed to better understand resilience and coping strategies in American Indian populations. A more in-depth look at types of discrimination and who perpetrates the discriminatory acts, for example whether Native or non-Native, would help inform interventions. It also is important to understand if there is a link between discrimination and violent victimization in Native youth, which directly relates to suicidality among all youth, but in particular Native youth because the prevalence of violent victimization is significantly higher for Native compared to other youth (78, 80, 412). In line with the historical trauma literature, more research is needed to quantify the connection between thinking about historical losses and grief, especially unresolved grief. More protective factor research is needed, including how cultural values inform resilience and their effect on positive mental health. More research is needed to determine why generational out-of-home placement was inversely associated with suicide risk in all but the final stressor models (Appendix C; Table 5, Model 4). Policy analysis is important to understand its effects on American Indian health and to inform future policies aimed at reducing disparate rates of suicide and related risk factors among Native youth and young adults. Evaluating prevention and intervention programs for the unique cultural context also is needed. Combining these efforts will build an evidence base of what works in Indian Country to reduce suicidality among Native youth and build on healthy, resilient, future generations.

More research is needed in tribal college populations to understand the apparent protective mechanisms at play in their ability to overcome adversity to help reduce suicide-related morbidity and mortality reservation-wide. This type of research would help us better understand how to prevent middle and high school age American Indians from progressing from suicidal ideation to actually attempting. Understanding the factors that most strongly influence positive mental health in the tribal college population is an important step in future research that builds on generalized and culturally unique protective factors (21, 476-478). Research with a

larger, more regionally diverse tribal college sample would allow us to examine regional and gender differences in risk and protective factors, including a more in-depth examination of anxiety and PTSD symptoms.

5.4. Conclusions and Significance

This dissertation research contributes to the literature by confirming previous research comparing American Indian and White youth and by showing differences in risk factors for both suicidal ideation and suicide attempt outcomes based on reservation versus urban location. It also contributes to the literature by testing a stress-coping model for suicide risk, which to our knowledge, had not previously been done in an American Indian population. These results have important implications for effective intervention development: by integrating protective factors, Native populations may effectively use cultural resources when designing programs and enacting policies protective against suicidality among American Indian youth and young adults.

The goal of this research was to address gaps in the literature. This goal was reached by expanding knowledge of risk factors for suicidal ideation and attempts in American Indian youth in an under-researched tribal area. This research also broadened the field by examining the association between suicide risk and culturally unique risk and protective factors in American Indian tribal college students. This fills an important gap because limited suicide research has been conducted with American Indian college students and to our knowledge this is the first suicide-related study to be conducted with tribal college students.

Results from Study 1 and Study 2 show that it is important for interventions to be tailored to meet the different needs of boys and girls, as well as the different needs of American Indian youth who reside predominantly in reservation, as opposed to urban, areas.

Results from the three studies combined show that the prevalence of stressors, such as childhood adversity and discrimination, are quite high in this population. Results from Study 2 show that reservation life may confer some protective benefit; however, growing up on the reservation did not affect the significance of any of the independent variables in Study 3. This may be due to a lack of variance, because 85% of the participants in Study 3 reported that they grew up on a reservation. The results from Study 3 demonstrate the importance of including culturally relevant risk and protective factors in the YRBS. These studies indicate the importance of teaching life skills, constructive coping, and instilling cultural values in American Indian youth and young adults. These teachings are warranted because the high levels of

trauma in this population may tax the ability of youth and young adults to successfully cope with life stressors.

These results have implications for development of culturally relevant interventions that have the potential to lessen the amount of childhood adversity present in the population and those that help increase constructive coping skills to help mitigate the effects of experiencing this adversity, and in turn, reducing suicide risk. In particular, the results provide empirical evidence to support the necessity of widely used Native-developed interventions, such as *Healthy Relationships* and *American Indian Life Skills*. Developed for Native adults, the dissertation data support the need for adapting the *Healthy Relationships* program for Native youth and also adapting the youth-focused *American Indian Life Skills* program for Native adults. These culturally relevant interventions were designed to help heal the disrupted attachments and resultant unhealthy coping mechanisms found in many tribal communities by addressing life skills, traditional parenting skills, and healthy relationships that build on cultural values, such as gratitude, generosity, and humility as well as relationships that are based on the premise that women and children are sacred and not to be abused. Increasing healthy coping skills also could help American Indian youth and young adults constructively cope with social stressors, such as experiencing discrimination and feeling a lack of safety at school. School screenings for mental health, dating violence, school safety, and substance use are warranted, as well as referral to culturally meaningful and gender-specific counseling, as well as programs such as *American Indian Life Skills*. Because there are few evidenced-based culturally relevant interventions, the results from this dissertation can be used to help secure funding to build an evidence-base and advance community-level capacity to most effectively implement these programs.

In conclusion, American Indian youth and young adults are at great risk for suicide and suicide-related risk factors. Knowing they are at increased risk is of utmost importance for current and future suicide prevention programs aimed at protecting American Indian populations. This research provides valuable information to enhance intervention efforts to meet the unique needs of this population. American Indian youth and young adults must be given the opportunity to reach their full potential - for the benefit of themselves, their families, and future healthy generations.

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APPENDIX A.

Appendix A.

Table 1. Prevalence of Suicidality and Select Risk Factors by Gender and Race/Ethnicity for American Indian and White Montana Youth: YRBS, 1999–2011

	Girls			Boys			Racial/Ethnic Differences		
	American Indian n = 628 (n) %	White n = 8814 (n) %	p value * <.0005	American Indian n = 695 (n) %	White n = 8715 (n) %	p value * <.0005	American Indian n = 1323 (n) %	White n = 17529 (n) %	p value * <.0005
Suicidal Thoughts/Behaviors									
Consider	(165) 26.8%*	(1813) 20.7%	.0003	(117) 17.1%*	(1019) 11.9%	<.0001	(282) 21.7%*	(2832) 16.4%	<.0001
Plan	(131) 21.0%	(1412) 16.1%	.0014	(90) 13.1%	(931) 10.8%	.0656	(221) 16.9%	(2343) 13.5%	.0006
Attempt	(106) 19.6%*	(731) 9.1%	<.0001	(63) 11.5%*	(380) 5.0%	<.0001	(169) 15.5%*	(1111) 7.1%	<.0001
Injury with attempt	(35) 6.5%*	(215) 2.7%	<.0001	(19) 3.4%	(146) 1.9%	.0148	(54) 4.9%*	(361) 2.3%	<.0001
Sadness/Hopelessness	(267) 43.2%*	(2748) 31.4%	<.0001	(169) 24.7%*	(1559) 18.1%	<.0001	(436) 33.5%*	(4307) 24.8%	<.0001
Alcohol, Tobacco, Marijuana									
Current drinking	(305) 53.8%*	(3779) 45.1%	<.0001	(310) 50.8%	(3929) 48.0%	.1773	(615) 52.3%*	(7708) 46.6%	.0002
Binge drinking	(245) 41.0%*	(2651) 30.6%	<.0001	(255) 38.8%	(3010) 35.4%	.0810	(500) 39.9%*	(5661) 33.0%	<.0001
Riding w/someone drinking	(272) 43.8%*	(2879) 32.9%	<.0001	(291) 42.4%*	(2786) 32.3%	<.0001	(563) 43.0%*	(5665) 32.6%	<.0001
Driving while drinking	(117) 19.2%	(1228) 14.1%	.0006	(120) 18.2%	(1600) 18.8%	.7088	(237) 18.7%	(2828) 16.4%	.0372
Current smoking	(300) 52.3%*	(1703) 20.1%	<.0001	(240) 39.4%*	(1634) 19.7%	<.0001	(540) 45.7%*	(3337) 19.9%	<.0001
Current marijuana use	(265) 43.9%*	(1576) 18.1%	<.0001	(275) 42.1%*	(1859) 21.9%	<.0001	(540) 43.0%*	(3435) 20.0%	<.0001
Inhalant Drugs									
Cocaine	(103) 17.0%*	(517) 6.0%	<.0001	(102) 15.2%*	(650) 7.6%	<.0001	(205) 16.1%*	(1167) 6.8%	<.0001
Current cocaine	(43) 7.0%*	(171) 2.0%	<.0001	(43) 6.4%*	(263) 3.1%	<.0001	(86) 6.7%*	(434) 2.5%	<.0001
Meth	(116) 18.8%*	(502) 5.7%	<.0001	(92) 13.7%*	(561) 6.5%	<.0001	(208) 16.1%*	(1063) 6.1%	<.0001
Injection Drugs									
Heroin	(28) 4.5%*	(136) 1.6%	<.0001	(44) 6.5%*	(252) 2.9%	<.0001	(72) 5.5%*	(388) 2.2%	<.0001
Steroids	(43) 6.9%*	(203) 2.3%	<.0001	(43) 6.3%	(339) 3.9%	.0023	(86) 6.6%*	(542) 3.1%	<.0001
Injection drugs	(31) 5.0%*	(111) 1.3%	<.0001	(31) 4.6%	(230) 2.7%	.0037	(62) 4.8%*	(341) 2.0%	<.0001
Early Risk-Taking Behavior									
Smoking under age 13	(224) 37.8%*	(1127) 13.4%	<.0001	(244) 38.1%*	(1433) 17.4%	<.0001	(468) 38.0%*	(2560) 15.4%	<.0001
Drinking under age 13	(178) 29.6%*	(1835) 22.0%	<.0001	(239) 36.7%	(2649) 32.2%	.0191	(417) 33.3%*	(4484) 27.0%	<.0001
Marijuana use under age 13	(177) 29.2%*	(474) 5.4%	<.0001	(246) 37.5%*	(826) 9.7%	<.0001	(423) 33.5%*	(1300) 7.5%	<.0001
Sex under age 13	(36) 6.4%*	(215) 2.6%	<.0001	(105) 18.1%*	(463) 5.8%	<.0001	(141) 12.3%*	(678) 4.1%	<.0001

*p value <.0005

Table 1. Continued		Girls			Boys			Racial/Ethnic Differences		
	American Indian n = 628 (n) %	White n = 8814 (n) %	p value * $< .0005$	American Indian n = 628 (n) %	White n = 8814 (n) %	p value * $< .0005$	American Indian n = 1323 (n) %	White n = 17529 (n) %	p value * $< .0005$	
Lack of School Safety										
Feeling unsafe at school	(64) 10.3%*	(292) 3.3%	$< .0001$	(52) 7.6%*	(269) 3.1%	$< .0001$	(116) 8.8%*	(561) 3.2%	$< .0001$	
Being threatened at school	(41) 6.6%	(410) 4.7%	.0322	(72) 10.4%	(748) 8.6%	.1079	(113) 8.6%	(1158) 6.6%	.0065	
Partner Victimization										
Dating violence	(97) 15.8%*	(815) 9.3%	$< .0001$	(90) 13.3%	(839) 9.8%	.0034	(187) 14.5%*	(1654) 9.5%	$< .0001$	
Sexual assault	(95) 15.4%	(1046) 12.0%	.0125	(67) 9.8%*	(419) 4.9%	$< .0001$	(162) 12.4%*	(1465) 8.4%	$< .0001$	
Risky Sexual Behaviors										
Sex with 4 or more in life	(115) 20.3%*	(963) 11.5%	$< .0001$	(180) 31.6%*	(977) 12.2%	$< .0001$	(295) 26.0%*	(1940) 11.8%	$< .0001$	
Sex with 1 or more past 3 mos	(239) 42.2%*	(2552) 30.5%	$< .0001$	(256) 44.5%*	(2182) 27.4%	$< .0001$	(495) 43.4%*	(4734) 29.0%	$< .0001$	
Sex with alcohol	(104) 18.5%*	(889) 10.6%	$< .0001$	(125) 21.7%*	(1035) 13.0%	$< .0001$	(229) 20.1%*	(1924) 11.8%	$< .0001$	
Used condom (no)	(149) 26.6%*	(1465) 17.6%	$< .0001$	(140) 24.8%*	(1246) 15.7%	$< .0001$	(289) 25.7%*	(2711) 16.7%	$< .0001$	
Unhealthy Weight Control										
Diet pills	(68) 11.0%	(646) 7.4%	.0012	(58) 8.6%*	(328) 3.8%	$< .0001$	(126) 9.8%*	(974) 5.6%	$< .0001$	
Fast	(151) 24.5%*	(1363) 15.6%	$< .0001$	(102) 15.2%*	(569) 6.6%	$< .0001$	(253) 19.6%*	(1932) 11.2%	$< .0001$	
Purge	(53) 8.7%	(634) 7.3%	.1922	(38) 5.7%*	(226) 2.7%	$< .0001$	(91) 7.1%	(860) 5.0%	.0010	
Weapon Carrying										
Carried a weapon	(55) 9.0%	(647) 7.4%	.1672	(222) 34.2%	(2935) 34.9%	.6836	(277) 21.9%	(3582) 21.0%	.4148	
Carried a gun	(12) 1.9%	(166) 1.9%	.9427	(97) 14.7%	(1248) 14.7%	.9992	(109) 8.5%	(1414) 8.2%	.6880	

*p value <.0005

Appendix A.

Table 2. Multiple Variable Models for Suicidal Ideation/Attempt (in Prior 12 Months) in Montana Youth: YRBS, 1999–2011

	American Indian Girls AOR ^a (95% CI)	American Indian Boys AOR ^a (95% CI)	White Girls AOR ^a (95% CI)	White Boys AOR ^a (95% CI)
Sadness/Hopelessness	4.13 (2.51, 6.81)****	6.23 (3.59, 10.80)****	6.57 (5.76, 7.49)****	8.80 (7.53, 10.28)****
Alcohol/Tobacco/Marijuana	1.13 (0.85, 1.51)	1.43 (1.05, 1.94)*	1.13 (1.04, 1.23)**	1.07 (0.98, 1.17)
Inhalant Drugs	0.96 (0.63, 1.45)	0.79 (0.47, 1.33)	1.04 (0.86, 1.26)	1.10 (0.92, 1.32)
Injection Drugs	1.01 (0.40, 2.59)	1.86 (0.79, 4.40)	1.64 (0.96, 2.79)	1.08 (0.86, 1.36)
Early Risk-Taking Behaviors	1.13 (0.47, 2.73)	1.25 (0.51, 3.04)	1.55 (1.20, 2.00)***	1.83 (1.39, 2.40)****
Lack of School Safety	1.63 (0.74, 3.58)	1.15 (0.80, 1.66)	1.43 (1.13, 1.81)**	1.28 (1.13, 1.45)***
Partner Victimization	2.01 (0.92, 4.38)	1.02 (0.40, 2.62)	1.88 (1.47, 2.39)****	1.76 (1.27, 2.43)***
Risky Sexual Behaviors	1.14 (0.79, 1.66)	1.01 (0.71, 1.45)	1.12 (0.99, 1.27)	1.29 (1.14, 1.47)****
Unhealthy Weight Control	4.54 (1.55, 13.33)**	2.21 (0.69, 7.10)	3.86 (2.96, 5.03)****	2.15 (1.43, 3.22)***
Weapon Carrying	1.59 (0.79, 3.22)	1.34 (1.05, 1.72)*	1.16 (1.01, 1.32)*	1.01 (0.95, 1.08)
Age	0.77 (0.62, 0.97)*	1.00 (0.78, 1.28)	0.85 (0.81, 0.90)****	0.90 (0.84, 0.96)**

AOR = adjusted odds ratio; CI = confidence interval

^a Bolded odds ratios indicate a statistically significant association comparing those who reported ideation or attempt and those who did not within each group; odds ratios are adjusted for all other model variables.

* p < .05

** p < .01

*** p < .001

**** p < .0001

APPENDIX B.

Appendix B.

Table 1. Descriptive Data for Suicidal Ideation, Suicide Attempts, and Risk Factor Clusters by Gender for Reservation ($n = 3748$) and Urban ($n = 2669$) Youth

Outcome Variable	Girls			Boys		
	Reservation $n = 1860$	Urban $n = 1284$	p value * $<.004$	Reservation $n = 1888$	Urban $n = 1385$	p value * $<.004$
	(n) %	(n) %		(n) %	(n) %	
Suicidal Ideation ^a	(276) 15.1%	(230) 18.2%	.0194	(217) 11.9%	(182) 13.4%	.1960
Suicide Attempts	(352) 19.2%	(254) 20.1%	.5362	(250) 9.6%	(219) 10.4%	.0476
Risk Factor Clusters ^b						
Sadness/Hopelessness	40.4%	49.0%*	$<.0001$	23.1%	26.2%	.0438
Alcohol/Tobacco/Marijuana	41.9%*	35.9%	$<.0001$	39.1%*	35.5%	.0030
Inhalant Drugs	10.3%	11.7%	.1188	9.5%	11.3%	.0447
Injection Drugs	3.2%	5.4%*	$<.0001$	3.9%	6.0%*	.0004
Disordered Eating	12.2%	14.3%	.0169	8.0%	8.4%	.6341
Early Risk-Taking Behavior	26.5%	25.4%	.3019	29.7%	30.3%	.6015
Lack of School Safety	6.9%	7.0%	.8925	7.6%	9.3%	.0256
Partner Victimization	13.4%	18.5%*	$<.0001$	11.7%	12.5%	.3644
Risky Sexual Behaviors	28.8%	27.2%	.1488	31.1%*	26.1%	$<.0001$
Weapon Carrying	6.1%	9.2%*	$<.0001$	22.1%	30.0%*	$<.0001$

* p value $<.004$ (Bonferroni corrected)

^a Responded yes to ideation, but not to attempt

^b Proportion of affirmative responses in each cluster (presented as a percent)

Appendix B.

	Reservation Girls <i>n</i> = 1777 AOR ^b (95% CI)	Urban Girls <i>n</i> = 1236 AOR ^b (95% CI)
Sadness/Hopelessness	2.64 (1.98, 3.50)^c	4.41 (3.09, 6.28)^c
Alcohol/Tobacco/Marijuana	1.16 (1.00, 1.35)	1.06 (0.89, 1.27)
Inhalant Drugs	0.73 (0.54, 0.98)^f	0.86 (0.63, 1.19)
Injection Drugs	0.96 (0.56, 1.65)	0.76 (0.44, 1.32)
Disordered Eating	1.80 (1.07, 3.02)^f	0.65 (0.36, 1.20)
Early Risk-Taking Behaviors	1.01 (0.61, 1.67)	0.61 (0.34, 1.11)
Lack of School Safety	1.09 (0.82, 1.45)	1.06 (0.79, 1.44)
Partner Victimization	1.64 (1.01, 2.66)^f	1.92 (1.15, 3.20)^f
Risky Sexual Behaviors	0.98 (0.87, 1.11)	0.99 (0.86, 1.14)
Weapon Carrying	0.90 (0.65, 1.24)	0.99 (0.77, 1.27)

Abbreviations: AOR, adjusted odds ratio

^a Responded yes to ideation, but not to attempt.

^b Odds ratios are adjusted for age and all other model variables.

^c *p* < .0001

^d *p* < .001

^e *p* < .01

^f *p* < .05

Appendix B.

Table 3. Logistic Regression Models for Suicidal Ideation^a for Boys

	Reservation Boys <i>n</i> = 1750 AOR ^b (95% CI)	Urban Boys <i>n</i> = 1331 AOR ^b (95% CI)
Sadness/Hopelessness	3.83 (2.78, 5.27)^c	5.34 (3.77, 7.56)^c
Alcohol/Tobacco/Marijuana	1.00 (0.85, 1.19)	1.09 (0.92, 1.30)
Inhalant Drugs	0.88 (0.65, 1.19)	1.06 (0.76, 1.47)
Injection Drugs	0.96 (0.61, 1.52)	0.73 (0.43, 1.24)
Disordered Eating	1.71 (0.87, 3.37)	1.80 (0.83, 3.89)
Early Risk-Taking Behaviors	1.74 (1.02, 2.99)^f	1.10 (0.62, 1.95)
Lack of School Safety	0.98 (0.80, 1.21)	0.94 (0.77, 1.16)
Partner Victimization	2.22 (1.30, 3.78)^e	1.17 (0.64, 2.15)
Risky Sexual Behaviors	0.97 (0.84, 1.13)	0.95 (0.81, 1.12)
Weapon Carrying	1.19 (1.03, 1.37)^f	0.97 (0.84, 1.13)

Abbreviations: AOR, adjusted odds ratio

^a Responded yes to ideation, but not to attempt.

^b Odds ratios are adjusted for age and all other model variables.

^c *p* < .0001

^d *p* < .001

^e *p* < .01

^f *p* < .05

Appendix B.

Table 4. Logistic Regression Models for Suicide Attempts for Girls

	Reservation Girls <i>n</i> = 1778 AOR ^a (95% CI)	Urban Girls <i>n</i> = 1237 AOR ^a (95% CI)
Sadness/Hopelessness	2.37 (1.82, 3.07)^b	2.25 (1.61, 3.15)^b
Alcohol/Tobacco/Marijuana	1.13 (0.99, 1.30)	1.02 (0.86, 1.20)
Inhalant Drugs	0.88 (0.69, 1.11)	1.39 (1.07, 1.82)^e
Injection Drugs	1.14 (0.74, 1.76)	1.22 (0.76, 1.95)
Unhealthy Weight Control	1.96 (1.20, 3.20)^d	2.88 (1.67, 4.96)^b
Early Risk-Taking Behaviors	2.40 (1.53, 3.77)^c	1.92 (1.10, 3.35)^e
Lack of School Safety	1.33 (1.03, 1.78)^e	1.53 (1.12, 2.10)^d
Partner Victimization	2.09 (1.34, 3.26)^c	1.88 (1.15, 3.08)^e
Risky Sexual Behaviors	1.00 (0.89, 1.12)	1.05 (0.91, 1.21)
Weapon Carrying	1.32 (1.02, 1.70)^e	1.27 (1.01, 1.59)^e

Abbreviations: AOR, adjusted odds ratio

^a Odds ratios are adjusted for age and all other model variables.

^b *p* < .0001

^c *p* < .001

^d *p* < .01

^e *p* < .05

Appendix B.

Table 5. Logistic Regression Models for Suicide Attempts for Boys

	Reservation Boys <i>n</i> = 1751 AOR ^a (95% CI)	Urban Boys <i>n</i> = 1312 AOR ^a (95% CI)
Sadness/Hopelessness	2.75 (2.02, 3.74)^b	2.03 (1.44, 2.85)^b
Alcohol/Tobacco/Marijuana	1.16 (0.99, 1.35)	1.16 (0.999, 1.36)
Inhalant Drugs	1.19 (0.92, 1.54)	0.95 (0.71, 1.27)
Injection Drugs	1.31 (0.89, 1.91)	1.36 (0.89, 2.06)
Unhealthy Weight Control	0.99 (0.49, 1.97)	3.05 (1.53, 5.92)^d
Early Risk-Taking Behaviors	1.42 (0.84, 2.37)	1.96 (1.14, 3.36)^e
Lack of School Safety	1.26 (1.05, 1.51)^e	1.20 (1.01, 1.42)^e
Partner Victimization	0.96 (0.55, 1.67)	1.81 (1.06, 3.10)^e
Risky Sexual Behaviors	0.97 (0.84, 1.12)	1.01 (0.86, 1.18)
Weapon Carrying	1.03 (0.90, 1.18)	0.99 (0.86, 1.14)

Abbreviations: AOR, adjusted odds ratio

^a Odds ratios are adjusted for age and all other model variables.

^b *p* < .0001

^c *p* < .001

^d *p* < .01

^e *p* < .05

APPENDIX C.

Appendix C.

Figure 1. Culturally Informed Stress-Coping Model for Suicide Risk for Montana-Wyoming Tribal College Students

Appendix C.

Table 1. Lifetime and Past 12 Month Prevalence of Suicidality and Suicide Risk Scores for Montana-Wyoming American Indian Tribal College Students: 2012-2013

	Total n (%)
Suicidality	
Lifetime ideation (<i>n</i> = 172)	89 (51.7%)
Lifetime plans (<i>n</i> = 185)	60 (32.4%)
Lifetime tell someone (<i>n</i> = 177)	46 (26.0%)
Lifetime attempts (<i>n</i> = 182)	49 (26.9%)
1 attempt	27 (14.8%)
More than 1 attempt	22 (12.1%)
Past 12-month ideation (<i>n</i> = 175)	47 (26.9%)
Past 12-month plans (<i>n</i> = 183)	11 (6.0%)
Past 12-month tell someone (<i>n</i> = 184)	17 (9.2%)
Past 12-month attempts* (<i>n</i> = 185)	-
Suicide risk score (<i>n</i> = 187)	
0	95 (50.8%)
1	5 (2.7%)
2	14 (7.5%)
3	10 (5.4%)
4	20 (10.7%)
5	22 (11.8%)
6	13 (7.0%)
7 or higher	8 (4.3%)
Total	187 (100.0%)

^aNot reported as per agreement with Rocky Mountain Tribal Institutional Review Board

Appendix C.

Table 2. Socio-Demographic Characteristics and Bivariate Models of Suicide Risk for Montana-Wyoming American Indian Tribal College Students: 2012-2013

	n (%)	OR ^a (95% CI) Bivariate
Age group (<i>n</i> = 187)		1.13 (0.90, 1.40)
18-24 years	102 (54.6%)	
>=25 years	85 (45.5%)	
Gender (<i>n</i> = 184)		0.82 (0.65, 1.03)
Men	65 (35.3%)	
Women	119 (64.7%)	
Current household income (<i>n</i> = 178)		0.87 (0.82, 0.92)
<\$10,000/year	98 (55.1%)	
Where spent most of childhood (<i>n</i> = 187)		1.08 (0.79, 1.48)
On or near a reservation	159 (85.0%)	
Mother's education (<i>n</i> = 177)		1.09 (0.87, 1.37)
High school degree or less	75 (40.1%)	
Boarding school attendance		
Participant (<i>n</i> = 186)	26 (14.0%)	0.67 (0.47, 0.95)
Parents		
Mother (<i>n</i> = 185)	50 (27.0%)	1.15 (0.90, 1.47)
Father (<i>n</i> = 182)	33 (18.1%)	1.34 (1.02, 1.76)
Grandparents (<i>n</i> = 183)		0.98 (0.90, 1.07)
Foster care/adoption		
Participant (combined) (<i>n</i> = 187)		1.35 (1.11, 1.63)
Foster care (<i>n</i> = 185)	28 (15.1%)	1.44 (1.08, 1.92)
Adoption (<i>n</i> = 180)	17 (9.4%)	1.57 (1.11, 2.23)
Parents (<i>n</i> = 187)		
Mother (<i>n</i> = 186)	22 (11.8%)	1.62 (1.19, 2.21)
Father (<i>n</i> = 185)	18 (9.7%)	1.14 (0.80, 1.64)
Grandparents (<i>n</i> = 182)		1.16 (0.89, 1.51)
Generational out-of home placement^b (<i>n</i> = 187)		1.06 (1.01, 1.13)

OR = odds ratio; CI = confidence interval

^aBolded odds ratios indicate a statistically significant association between the independent variable and suicide risk score

^bIncludes 2 generations of boarding school attendance (parents, grandparents) and 3 generations of foster care/adoption (participant, parents, grandparents)

Appendix C.

Table 3. Scale Psychometrics and Bivariate Models of Suicide Risk for Montana-Wyoming American Indian Tribal College Students: 2012-2013

Dependent Variable	Scale Range	Mean (SD)	Cronbach's α	OR ^a (95% CI) Bivariate
Suicide risk	0-11	2.12 (2.51)	.82	
Hypothesized Stressors				
Adverse childhood events (ACE)	0-16	5.09 (3.46)	.80	9.32 (5.71, 15.23)
Traumatic events inventory	0-24	5.73 (4.11)	.82	11.82 (6.53, 21.38)
Parental control (mom)	4-20	12.77 (2.86)	.57	1.69 (1.44, 1.98)
Everyday discrimination	9-54	23.54 (10.97)	.91	1.44 (1.32, 1.57)
Perceived stress	10-50	28.27 (6.51)	.82	2.19 (1.83, 2.62)
Historical loss	12-72	35.94 (14.44)	.94	1.46 (1.33, 1.60)
Grief	12-60	32.54 (11.60)	.92	1.32 (1.17, 1.49)
Mental health				
Depressive symptoms	20-80	36.48 (10.54)	.89	3.36 (2.76, 4.10)
Anxiety symptoms	7-28	12.01 (5.27)	.94	2.01 (1.83, 2.42)
Post-traumatic stress symptoms	8-32	15.12 (7.11)	.94	1.71 (1.51, 1.94)
Hypothesized Protective Factors				
Social support	0-54	15.65 (10.40)	.96	0.90 (0.84, 0.96)
Self-esteem	6-24	19.23 (3.29)	.81	0.46 (0.37, 0.56)
Spirituality	3-15	10.92 (3.28)	.86	1.19 (1.07, 1.32)
Resilience	14-98	80.43 (16.41)	.97	1.00 (0.91, 1.11)
Gratitude	6-42	34.87 (6.61)	.76	0.70 (0.64, 0.78)
American Indian identity	8-40	24.83 (7.53)	.89	1.04 (0.92, 1.16)
Brief COPE 2-item Subscales^b				
Active	2-8	5.82 (1.66)	.61	1.17 (1.01, 1.36)
Planning	2-8	5.79 (1.72)	.77	1.03 (0.91, 1.18)
Positive reframing	2-8	5.74 (1.72)	.80	0.97 (0.85, 1.11)
Acceptance	2-8	5.61 (1.64)	.56	1.14 (0.99, 1.30)
Humor	2-8	4.75 (1.85)	.75	1.39 (1.23, 1.57)
Religious/spiritual	2-8	5.38 (2.12)	.85	1.17 (1.05, 1.30)
Emotional support	2-8	5.20 (1.88)	.80	0.88 (0.78, 0.99)
Instrumental support	2-8	5.41 (1.80)	.78	0.88 (0.78, 1.00)
Self-distraction	2-8	5.61 (1.52)	.27	1.67 (1.43, 1.95)
Denial	2-8	3.23 (1.38)	.65	1.53 (1.33, 1.77)
Venting	2-8	4.32 (1.62)	.54	1.63 (1.42, 1.87)
Substance use	2-8	3.39 (1.87)	.90	1.46 (1.31, 1.63)
Behavioral disengagement	2-8	3.39 (1.46)	.58	1.77 (1.54, 2.03)
Self-blame	2-8	4.37 (1.72)	.64	1.91 (1.68, 2.17)
Coping Factors				
Constructive coping	16-64	44.59 (9.59)	.88	1.17 (0.97, 1.40)
Non-constructive coping	12-48	23.43 (6.18)	.80	3.22 (2.61, 3.99)

OR = odds ratio; CI = confidence interval

^aBolded odds ratios indicate a statistically significant association between the independent variable and suicide risk score

^bTwo-item scales are less reliable than multi-item scales; assess Cronbach's α with caution

Appendix C.

Table 4. Summary of Principal Component Factor Loadings for Brief COPE Subscales for Montana-Wyoming American Indian Tribal College Students: 2012-2013

Brief COPE Subscales	Rotated (Varimax) Factor Loadings	
	Factor 1 Constructive Coping	Factor 2 Non-constructive Coping
Self-distraction	.50*	.26
Active	.77*	-.04
Denial	-.03	.55*
Substance use	-.06	.55*
Emotional support	.67*	-.04
Instrumental support	.73*	-.11
Behavioral disengagement	-.14	.74*
Venting	.31	.71*
Positive reframing	.74*	.09
Planning	.82*	.09
Humor	.38*	.48*
Acceptance	.72*	.15
Religious/Spiritual	.51*	-.01
Self-blame	.08	.73*

*Values greater than .35

Appendix C.

Table 5. Multiple Stressor Models of Suicide Risk for Montana-Wyoming American Indian Tribal College Students: 2012-2013

STRESSORS	AOR ^a (95% CI)	AOR ^a (95% CI)	AOR ^a (95% CI)	AOR ^a (95% CI)
	Model 1 <i>n</i> = 147 AIC = 1470	Model 2 <i>n</i> = 171 AIC = 1654	Model 3 <i>n</i> = 168 AIC = 1624	Model 4 <i>n</i> = 168 AIC = 1624
ACE ^b	4.50 (2.36, 8.57)	4.33 (2.37, 7.93)	3.71 (2.00, 6.89)	3.91 (2.11, 7.22)
Traumatic events inventory	2.52 (1.07, 5.98)	2.94 (1.35, 6.41)	2.34 (1.06, 5.19)	2.23 (1.01, 4.93)
Parental control (mom)	1.37 (1.13, 1.66)	1.36 (1.15, 1.62)	1.25 (1.04, 1.49)	1.25 (1.04, 1.49)
Discrimination	1.25 (1.12, 1.40)	1.22 (1.09, 1.36)	1.16 (1.04, 1.30)	1.17 (1.05, 1.31)
Perceived stress	1.37 (1.09, 1.73)	1.35 (1.10, 1.66)	1.15 (0.92, 1.45)	
Historical loss	1.30 (1.14, 1.48)	1.24 (1.11, 1.39)	1.22 (1.09, 1.37)	1.22 (1.09, 1.37)
Grief	0.92 (0.78, 1.07)			
Generational out-of-home placement ^c	0.88 (0.81, 0.96)	0.89 (0.82, 0.96)	0.92 (0.85, 0.99)	0.92 (0.85, 1.00)
Depressive symptoms			1.58 (1.19, 2.10)	1.70 (1.31, 2.20)

AOR = adjusted odds ratio; CI = confidence interval

^aBolded odds ratios indicate a statistically significant association between the independent variable and suicide risk; odds ratios are adjusted for all other model variables

^bACE: Adverse Childhood Experiences

^cIncludes 2 generations of boarding school attendance (parents, grandparents) and 3 generations of foster care/adoption (participant, parents, grandparents)

Appendix C.

Table 6. Multiple Protective and Brief COPE Factors of Suicide Risk for Montana-Wyoming American Indian Tribal College Students: 2012-2013

	AOR ^a (CI)	AOR ^a (CI)
	Model 1	Model 2
	<i>n</i> = 165 AIC = 1675	<i>n</i> = 165 AIC = 1649
Boarding school attendance ^b	0.41 (0.26, 0.63)	0.43 (0.28, 0.67)
Social Support	0.91 (0.83, 0.98)	0.90 (0.83, 0.98)
Self-esteem	0.47 (0.36, 0.60)	0.63 (0.47, 0.83)
Spirituality	1.36 (1.20, 1.54)	1.31 (1.15, 1.49)
Resilience	1.46 (1.27, 1.69)	1.26 (1.07, 1.47)
Gratitude	0.64 (0.56, 0.74)	0.69 (0.60, 0.80)
American Indian identity	1.04 (0.90, 1.19)	1.04 (0.90, 1.19)
Constructive coping		1.21 (0.93, 1.58)
Non-constructive coping		1.85 (1.42, 2.41)

AOR = adjusted odds ratio; CI = confidence interval

^aBolded odds ratios indicate a statistically significant association between the independent variable and suicide risk; odds ratios are adjusted for all other model variables

^bParticipant only

Appendix C.

Table 7. Multiple Stress-Coping Models of Suicide Risk for Montana-Wyoming American Indian Tribal College Students: 2012-2013

	AOR ^a (95% CI)	AOR ^a (95% CI)	AOR ^a (95% CI)	AOR ^a (95% CI)
	Model 1 <i>n</i> = 160 AIC = 1534	Model 2 <i>n</i> = 160 AIC = 1532	Model 3 <i>n</i> = 160 AIC = 1518	Model 4 <i>n</i> = 160 AIC = 1519
ACE ^b	3.88 (2.02, 7.45)	3.49 (1.80, 6.77)	2.89 (1.46, 5.69)	2.79 (1.41, 5.51)
Traumatic events inventory	2.49 (1.11, 5.55)	2.16 (0.95, 4.89)	2.47 (1.09, 5.64)	2.23 (0.96, 5.19)
Parental control (mom)	1.33 (1.11, 1.60)	1.27 (1.05, 1.54)	1.28 (1.06, 1.55)	1.25 (1.03, 1.51)
Discrimination	1.10 (0.96, 1.24)	1.07 (0.95, 1.21)	1.07 (0.94, 1.20)	1.05 (0.93, 1.19)
Historical loss	1.15 (1.01, 1.30)	1.13 (1.00, 1.28)	1.10 (0.98, 1.25)	1.10 (0.97, 1.25)
Generational out-of-home placement ^c	0.93 (0.85, 1.01)	0.94 (0.86, 1.02)	0.93 (0.85, 1.01)	0.93 (0.86, 1.02)
Boarding school attendance ^d	0.47 (0.31, 0.73)	0.45 (0.29, 0.71)	0.46 (0.30, 0.71)	0.45 (0.29, 0.69)
Social support	0.91 (0.84, 0.99)	0.91 (0.83, 0.99)	0.89 (0.81, 0.97)	0.89 (0.81, 0.97)
Self-esteem	0.73 (0.55, 0.97)	0.79 (0.59, 1.07)	0.85 (0.63, 1.16)	0.89 (0.65, 1.21)
Spirituality	1.35 (1.17, 1.55)	1.34 (1.16, 1.54)	1.34 (1.16, 1.54)	1.33 (1.16, 1.54)
Resilience	1.26 (1.06, 1.48)	1.24 (1.05, 1.47)	1.18 (0.99, 1.41)	1.18 (0.99, 1.40)
Gratitude	0.72 (0.62, 0.83)	0.75 (0.64, 0.87)	0.73 (0.63, 0.85)	0.75 (0.64, 0.87)
American Indian identity	1.03 (0.87, 1.20)	1.04 (0.88, 1.22)	1.05 (0.89, 1.24)	1.06 (0.90, 1.24)
Depressive symptoms		1.35 (1.00, 1.82)		1.20 (0.88, 1.64)
Constructive coping			1.24 (0.93, 1.66)	1.26 (0.94, 1.68)
Non-constructive coping			1.75 (1.30, 2.36)	1.67 (1.23, 2.28)

AOR = adjusted odds ratio; CI = confidence interval

^aBolded odds ratios indicate a statistically significant association between the independent variable and suicide risk; odds ratios are adjusted for all other model variables

^bACE: Adverse Childhood Experiences

^cIncludes 2 generations of boarding school attendance (parents, grandparents) and 3 generations of foster care/adoption (participant, parents, grandparents)

^dParticipant only

Appendix C.

Table 8. Multiple Stress-Coping Models (with Control Variables) of Suicide Risk for Montana-Wyoming American Indian Tribal College Students: 2012-2013

	AOR ^a (95% CI)	AOR ^a (95% CI)	AOR ^a (95% CI)	AOR ^a (95% CI)	AOR ^a (95% CI)
	Model 1 <i>n</i> = 157 AIC = 1485	Model 2 <i>n</i> = 160 AIC = 1508	Model 3 <i>n</i> = 154 AIC = 1493	Model 4 <i>n</i> = 151 AIC = 1422	Model 5 <i>n</i> = 160 AIC = 1519
ACE ^b	2.68 (1.34, 5.35)	3.01 (1.51, 6.00)	2.49 (1.26, 4.94)	3.02 (1.48, 6.16)	2.85 (1.44, 5.66)
Traumatic events inventory	2.04 (0.86, 4.85)	3.35 (1.38, 8.12)	2.53 (1.09, 5.89)	2.69 (1.08, 6.72)	2.43 (1.03, 5.72)
Parental control (mom)	1.27 (1.04, 1.55)	1.26 (1.03, 1.53)	1.27 (1.04, 1.54)	1.26 (1.03, 1.53)	1.26 (1.04, 1.53)
Discrimination	1.04 (0.92, 1.18)	1.00 (0.88, 1.14)	1.07 (0.95, 1.22)	1.05 (0.92, 1.21)	1.05 (0.93, 1.19)
Historical loss	1.09 (0.96, 1.24)	1.10 (0.97, 1.25)	1.10 (0.98, 1.25)	1.19 (1.04, 1.36)	1.10 (0.97, 1.24)
Generational out-of-home placement ^c	0.95 (0.87, 1.03)	0.95 (0.87, 1.04)	0.93 (0.85, 1.01)	0.89 (0.81, 0.98)	0.94 (0.86, 1.02)
Boarding school attendance ^d	0.38 (0.23, 0.62)	0.52 (0.33, 0.82)	0.46 (0.30, 0.71)	0.55 (0.35, 0.87)	0.45 (0.29, 0.69)
Social Support	0.90 (0.82, 0.98)	0.88 (0.80, 0.96)	0.91 (0.83, 1.00)	0.88 (0.80, 0.97)	0.89 (0.82, 0.98)
Self-esteem	0.82 (0.59, 1.13)	0.89 (0.65, 1.23)	0.87 (0.63, 1.20)	0.84 (0.60, 1.17)	0.90 (0.65, 1.23)
Spirituality	1.32 (1.14, 1.52)	1.45 (1.25, 1.70)	1.29 (1.12, 1.49)	1.35 (1.16, 1.56)	1.33 (1.16, 1.54)
Resilience	1.19 (1.00, 1.42)	1.29 (1.07, 1.56)	1.17 (0.98, 1.39)	1.22 (1.01, 1.47)	1.18 (0.99, 1.41)
Gratitude	0.74 (0.63, 0.87)	0.69 (0.59, 0.81)	0.75 (0.64, 0.87)	0.75 (0.64, 0.87)	0.75 (0.64, 0.87)
American Indian identity	1.06 (0.90, 1.26)	1.05 (0.90, 1.24)	1.00 (0.84, 1.18)	1.03 (0.86, 1.22)	1.04 (0.88, 1.23)
Depressive symptoms	1.30 (0.95, 1.80)	1.04 (0.75, 1.43)	1.15 (0.84, 1.56)	1.10 (0.79, 1.54)	1.17 (0.86, 1.60)
Constructive coping	1.33 (0.99, 1.78)	1.11 (0.82, 1.50)	1.23 (0.92, 1.64)	1.21 (0.89, 1.63)	1.22 (0.91, 1.64)
Non-constructive coping	1.44 (1.04, 2.00)	1.81 (1.33, 2.48)	1.51 (1.10, 2.08)	1.59 (1.12, 2.26)	1.71 (1.25, 2.34)
Gender	1.19 (0.89, 1.60)				
Age		0.83 (0.75, 0.92)			
Current income			0.92 (0.86, 0.99)		
Mother's Education				1.35 (0.99, 1.84)	
Childhood home ^e					1.25 (0.84, 1.87)

AOR = adjusted odds ratio; CI = confidence interval

^aBolded odds ratios indicate a statistically significant association between the independent variable and suicide risk; odds ratios are adjusted for all other model variables

^bACE: Adverse Childhood Experiences

^cIncludes 2 generations of boarding school attendance (parents, grandparents) and 3 generations of foster care/adoption (participant, parents, grandparents)

^dParticipant only

^eGrew up on or near a reservation vs. urban area/other

Want to volunteer to be in a suicide prevention research study?

*Suicide and Resilience in American Indian Tribal College
Students: The Role of Enculturation on Psychological Well-Being*

Are you American Indian?
Are you currently attending a Montana or Wyoming Tribal College?
Are you 18 or Over?
If you answered **YES** to all 3 questions, then you are eligible to participate!

The *purpose* of the research is to see if there are links between culturally-unique life stress, coping, and suicide ideation/attempts in American Indian Tribal college students to help develop prevention programs.

The study:

- Uses an anonymous, web-based survey.
- Takes place during a 3 week time-period during Fall 2012.
- Will take you about 30-40 minutes to finish.

For your time:

- You will be entered in a drawing for an item valued at ~\$150.

**MONTANA-WYOMING
TRIBAL LEADERS COUNCIL**

The study is a collaboration between the Montana Wyoming Tribal Leaders Council's *Planting Seeds of Hope* Youth Suicide Prevention Project and West Virginia University.

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IRB Approval on File

Appendix C.

Abridged Stress-Coping Survey.

1. First, please tell us the name of the Tribal College you are currently attending. _____

Now, we'll start with questions that ask things about you now and when you were growing up, some family history, and questions about education and employment.

2. What is your age group?

☐ 18-21 yrs

☐ 22-24 yrs

☐ 25-34 yrs

☐ 35-44 yrs

☐ 45-54 yrs

☐ 55 yrs and over

3. What is your gender?

☐ Male

☐ Female

4. What is your race/ethnic group? (Please check all that apply.)

☐ American Indian/Alaska Native (Please enter the name of your Tribe.) _____

☐ White

☐ Black/African American

☐ Asian

☐ Hispanic

☐ Other (Please describe.) _____

5. Where did you spend most of your childhood?

☐ On a reservation (Please enter the name of the Reservation below.) _____

☐ Near a reservation (within 100 miles)

☐ In an urban area

☐ Other (Please describe below.) _____

6. What is your current annual household income?

- ☐ Less than \$1,000
- ☐ \$1,000 - 4,999
- ☐ \$5,000 - 9,999
- ☐ \$10,000 - 19,999
- ☐ \$20,000 - 29,999
- ☐ \$30,000 - 39,999
- ☐ \$40,000 - 49,999
- ☐ \$50,000 or more

7. What's the highest year in school your MOTHER completed?

- ☐ Grade school
- ☐ Some high school
- ☐ GED
- ☐ 12th grade
- ☐ Some college
- ☐ 2 year college degree
- ☐ 4 year college degree
- ☐ Graduate degree
- ☐ Don't know

8. What's the highest year in school your FATHER completed?

- ☐ Grade school
- ☐ Some high school
- ☐ GED
- ☐ 12th grade
- ☐ Some college
- ☐ 2 year college degree
- ☐ 4 year college degree
- ☐ Graduate degree
- ☐ Don't know

9. When you were growing up, how often did you have...

	Almost Always	Often	Sometimes	Almost Never	Never
Enough food to eat	☐	☐	☐	☐	☐
Enough clothes	☐	☐	☐	☐	☐
A decent place to live	☐	☐	☐	☐	☐

10. When you were growing up, how often...

	Almost Always	Often	Sometimes	Almost Never	Never
Was your mother treated violently	☐	☐	☐	☐	☐
Were your emotional needs met	☐	☐	☐	☐	☐

11. When you were growing up....

	Yes	No
Did you live with someone who had a problem with drugs or alcohol	☐	☐
Did you live with someone who had a mental problem	☐	☐
Did your parent's divorce or separate	☐	☐
Did you live with a handicapped person	☐	☐

12. Did you go to boarding school?

- ☐ Yes
- ☐ No

13. Were you placed in foster care as a child?

- ☐ Yes
- ☐ No

14. Were you adopted out as a child?

- ☐ Yes
- ☐ No

15. Did either of your PARENTS or GRANDPARENTS attend a boarding school?

	Yes	No	Don't Know
Mother	☐	☐	☐
Father	☐	☐	☐
Maternal Grandmother	☐	☐	☐
Maternal Grandfather	☐	☐	☐
Paternal Grandmother	☐	☐	☐
Paternal Grandfather	☐	☐	☐

16. Were either of your PARENTS or GRANDPARENTS placed in foster care or adopted out?

	Yes	No	Don't Know
Mother	☐	☐	☐
Father	☐	☐	☐
Maternal Grandmother	☐	☐	☐
Maternal Grandfather	☐	☐	☐
Paternal Grandmother	☐	☐	☐
Paternal Grandfather	☐	☐	☐

17. Have any of your PARENTS/CAREGIVERS...

	Yes	No	Don't know
Been arrested	☐	☐	☐
Spent time in jail	☐	☐	☐

18. This set of questions asks about experiences that may have happened to you in your day-to-day life. In your DAY-TO-DAY LIFE, how often do any of the following things happen to you?

	Almost Everyday	At Least Once a Week	A Few Times a Month	A Few Times a Year	Less Than Once a Year	Never
You are treated with less courtesy than other people are.	☐	☐	☐	☐	☐	☐
You are treated with less respect than other people are.	☐	☐	☐	☐	☐	☐
You receive poorer service than other people at restaurants or stores.	☐	☐	☐	☐	☐	☐
People act as if they think you are not smart.	☐	☐	☐	☐	☐	☐
People act as if they are afraid of you.	☐	☐	☐	☐	☐	☐
People act as if they think you are dishonest.	☐	☐	☐	☐	☐	☐
People act as if they're better than you are.	☐	☐	☐	☐	☐	☐
You are called names or insulted.	☐	☐	☐	☐	☐	☐
You are threatened or harassed.	☐	☐	☐	☐	☐	☐

19. The next set of questions pertains to cultural losses. How often do you think about the following...

	Never	Yearly/Special Times	Monthly	Weekly	Daily	Several Times a Day
Loss of our land	☐	☐	☐	☐	☐	☐
Loss of our language	☐	☐	☐	☐	☐	☐
Losing our traditional spiritual ways	☐	☐	☐	☐	☐	☐
Loss of our family ties because of boarding schools	☐	☐	☐	☐	☐	☐
Loss of families from the reservation to government relocation	☐	☐	☐	☐	☐	☐
Loss of self-respect from poor treatment by government officials	☐	☐	☐	☐	☐	☐
Loss of trust in Whites from broken treaties	☐	☐	☐	☐	☐	☐
Losing our culture	☐	☐	☐	☐	☐	☐
Losses from the effects of alcoholism on our people	☐	☐	☐	☐	☐	☐
Loss of respect by our children and grandchildren for elders	☐	☐	☐	☐	☐	☐
Loss of our people through early death	☐	☐	☐	☐	☐	☐
Loss of respect by our children for traditional ways	☐	☐	☐	☐	☐	☐

20. The following questions ask about those in your life who provide you with help or support. Each question has two parts. For the first part, check all those, excluding yourself, who you can count on for help or support in the manner described. Then check how satisfied you are with the overall support you have. If you have no support for a question, check the words "No One", but still rate your level of satisfaction.

	Those in your life who provide help or support									
	Parent	Grand parent	Sibling	Other Relative	Friend	God/ Spiritual Being	Spiritual Elder	Clergy	No One	Other
Who can you really count on to be dependable when you need help?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Who can you really count on to help you feel more relaxed when you are under pressure or tense?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Who accepts you totally, including both your worst and your best points?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Who can you really count on to care about you regardless of what is happening to you?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Who can you really count on to help you feel better when you are feeling generally down-in-the-dumps?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Who can you count on to console you when you are very upset?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

21. The next set of questions is about your ethnic identity. Please answer for both columns (White or Anglo; American Indian) if they both pertain to you.

	The American Indian way of life					The White or Anglo way of life				
	Not at All	Not Much	Somewhat	A Lot	Very Much	Not at All	Not Much	Somewhat	A Lot	Very Much
Do you live by the following	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Are you/will you be a success in	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Does your family live by	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Is your family a success in	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

22. Some families have special activities or traditions (such as holiday parties, special meals, religious activities, trips, or visits). In your family, how many of the activities or traditions are based on...

	Very Much	A Lot	Somewhat	Not Much	Not at All
White Culture	☐	☐	☐	☐	☐
American Indian Culture	☐	☐	☐	☐	☐

23. How involved are you in...

	Very Much	A Lot	Somewhat	Not Much	Not at All
White Traditions & Beliefs	☐	☐	☐	☐	☐
American Indian Traditions & Beliefs	☐	☐	☐	☐	☐

24. How important it is for you to follow religious or spiritual beliefs that are based on...

	Not at all Important	Very Unimportant	Neither Important nor Unimportant	Very Important	Extremely Important
Christian Beliefs	☐	☐	☐	☐	☐
Traditional Indian Beliefs	☐	☐	☐	☐	☐

25. What languages were spoken in your home when you were growing up?

	Never	Rarely	Sometimes	Often	Almost Always	Exclusively
English	☐	☐	☐	☐	☐	☐
Tribal Language	☐	☐	☐	☐	☐	☐

26. How important is spirituality in your life?

- ☐ Extremely Important
- ☐ Very Important
- ☐ Neither Important nor Unimportant
- ☐ Not Very Important
- ☐ Not at all Important

26a. How often do you spend time on religious or spiritual practices?

- ☐ Everyday or Almost Everyday
- ☐ Several Times a Month
- ☐ From Time to Time, Occasionally
- ☐ Very Rarely
- ☐ Not at All

26b. How often do you seek comfort or guidance through religious or spiritual means?

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Quite Often
- ☐ Very Often

27. The next set of questions relates to your experiences with your parents/caregivers when you were growing up. The same questions are asked for your MOTHER/FEMALE CAREGIVER and FATHER/MALE CAREGIVER. Use NA (Not Applicable) where needed. DURING YOUR FIRST 16 YEARS, how 'true' are the following statements about your CAREGIVER's behavior towards you?

	MOTHER / FEMALE CAREGIVER					FATHER / MALE CAREGIVER				
	NA	Not True at All	Slightly True	Moderately True	Extremely True	NA	Not True at All	Slightly True	Moderately True	Extremely True
Overprotective of me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Verbally abusive of me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Over controlling of me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tried to make me feel guilty	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ignored me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Critical of me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Unpredictable towards me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Uncaring of me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Physically violent or abusive of me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Rejecting of me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Left me on my own a lot	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Would forget about me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Was uninterested in me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Made me feel in danger	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Made me feel unsafe	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

28. These questions list various attitudes and behaviors of parents/caregivers. As you remember your PARENT/CAREGIVER in YOUR FIRST 16 YEARS would you please check the most appropriate box next to each question? DURING YOUR FIRST 16 YEARS, how like this were your PARENT/CAREGIVERS...

	MOTHER / FEMALE CAREGIVER					FATHER / MALE CAREGIVER				
	NA	Very Like	Moderately Like	Moderately Unlike	Very Unlike	NA	Very Like	Moderately Like	Moderately Unlike	Very Unlike
Appeared to understand my problems and worries	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Could confide in them about things that were bothering me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gave me time and attention when I needed it	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gave me love and affection	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Appeared to put effort into watching over me and making sure I had a good upbringing	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Had strict rules for me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Was consistent about the rules for me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Expected me to do my best in everything I did	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Stopped me from doing things that other kids my age were allowed to do	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Was overprotective of me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Babied me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Abandoned me	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

29. How true is this statement for you? When I was growing up, I felt...

	NA	Not True at All	Slightly True	Moderately True	Extremely True
Responsible for things my parents should be doing.	☐	☐	☐	☐	☐
Like I was a parent to my parent.	☐	☐	☐	☐	☐

30. Please answer the following questions about yourself.

	Strongly Agree	Agree	Disagree	Strongly Disagree
I feel that I have many good qualities.	☐	☐	☐	☐
I feel that I am a failure.	☐	☐	☐	☐
I take a positive attitude toward myself.	☐	☐	☐	☐
I feel useless at times.	☐	☐	☐	☐
On the whole, I am satisfied with myself.	☐	☐	☐	☐
At times I think I am no good at all.	☐	☐	☐	☐

31. The next 10 questions relate to the amount of stress in your life. In the LAST MONTH, how often have you...

	Never	Almost Never	Sometimes	Fairly Often	Very Often
been upset because of something that happened unexpectedly	☐	☐	☐	☐	☐
felt that you were unable to control the important things in your life	☐	☐	☐	☐	☐
felt nervous and "stressed"?	☐	☐	☐	☐	☐
felt confident about your ability to handle your personal problems	☐	☐	☐	☐	☐
felt that things were going your way	☐	☐	☐	☐	☐
found that you could not cope with all the things that you had to do	☐	☐	☐	☐	☐
been able to control irritations in your life	☐	☐	☐	☐	☐
felt that you were on top of things	☐	☐	☐	☐	☐
been angered because of things that happened that were outside of your control	☐	☐	☐	☐	☐
felt difficulties were piling up so high that you could not overcome them	☐	☐	☐	☐	☐

32. The next items deal with how you cope with stress in your life.

	I Don't Do This at All	I Do This a Little Bit	I Do This a Medium Amount	I Do This a Lot
I turn to work or other activities to take my mind off things.	☐	☐	☐	☐
I concentrate my efforts on doing something about the situation I'm in.	☐	☐	☐	☐
I say to myself "this isn't real."	☐	☐	☐	☐
I use alcohol or other drugs to make myself feel better.	☐	☐	☐	☐
I get emotional support from others.	☐	☐	☐	☐
I give up trying to deal with it.	☐	☐	☐	☐
I take action to try to make the situation better.	☐	☐	☐	☐
I refuse to believe that it has happened.	☐	☐	☐	☐
I say things to let my unpleasant feelings escape.	☐	☐	☐	☐
I get help and advice from other people.	☐	☐	☐	☐
I use alcohol or other drugs to help me get through it.	☐	☐	☐	☐
I try to see it in a different light, to make it seem more positive.	☐	☐	☐	☐
I criticize myself.	☐	☐	☐	☐
I try to come up with a strategy about what to do.	☐	☐	☐	☐
I get comfort and understanding from someone.	☐	☐	☐	☐
I give up the attempt to cope.	☐	☐	☐	☐
I look for something good in what is happening.	☐	☐	☐	☐
I make jokes about it.	☐	☐	☐	☐
I do something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	☐	☐	☐	☐
I accept the reality of the fact that it has happened.	☐	☐	☐	☐
I express my negative feelings.	☐	☐	☐	☐
I try to find comfort in my religion or spiritual beliefs.	☐	☐	☐	☐
I try to get advice or help from other people about what to do.	☐	☐	☐	☐
I learn to live with it.	☐	☐	☐	☐
I think hard about what steps to take.	☐	☐	☐	☐
I blame myself for things that happen.	☐	☐	☐	☐
I pray or meditate.	☐	☐	☐	☐
I make fun of the situation.	☐	☐	☐	☐

If you report suicidal thoughts or behaviors, we encourage you to please take the time to talk to a tribal society member or tribal school counselor.

33. Have you EVER seriously thought about committing suicide?

☐ Yes

☐ No (If No, go to question #33.)

33a. If yes, how often have you seriously thought about it in the LAST 12 MONTHS?

☐ Not at All

☐ A Few Times

☐ Several Times

☐ Often

34. Have you EVER planned how you would commit suicide?

- ☐ Yes
- ☐ No (If No, go to question #34.)

34a. If yes, have you made a plan for committing suicide in the LAST 12 MONTHS?

- ☐ Yes
- ☐ No

35. Have you EVER told someone that you were thinking about committing suicide?

- ☐ Yes
- ☐ No (If No, go to question #35.)

35a. If yes, who did you tell? (Check all that apply)

- ☐ Family Member
- ☐ Friends/Peers
- ☐ Co-worker
- ☐ Trusted Confidant (e.g., teacher, coach, etc)
- ☐ Service provider (counselor, nurse, healer, doctor)
- ☐ Other (Please describe.) _____

35b. In the LAST 12 MONTHS, have you told someone you were thinking about committing suicide?

- ☐ Yes
- ☐ No (If No, go to question #34.)

35c. If yes, who did you tell?

- ☐ Family Member
- ☐ Friends/Peers
- ☐ Co-worker
- ☐ Trusted Confidant (e.g., teacher, coach, etc)
- ☐ Service provider (counselor, nurse, healer, doctor)
- ☐ Other (Please describe.) _____

36. Have you EVER attempted suicide?

- ☐ Yes
- ☐ No (If No, go to question #36.)

36a. If yes, how many times have you attempted suicide IN YOUR LIFETIME? _____

36b. If yes, how did you try to kill yourself?

- ☐ Shooting
- ☐ Stabbing or cutting
- ☐ Overdose
- ☐ Hanging
- ☐ Causing an Accident
- ☐ Jumping from Height
- ☐ Other (Please describe.) _____

36c. If yes, why did you try to kill yourself? _____

36d. Have you attempted suicide in the LAST 12 MONTHS?

- ☐ Yes
- ☐ No (If No, go to question #75.)

36e. How you attempted suicide in the LAST 6 MONTHS?

- ☐ Yes
- ☐ No

37. This set of questions is about traumatic events that may have happened to you or your loved ones. Please indicate whether you have experienced each event IN YOUR LIFETIME. If you answer yes, then please indicate the NUMBER OF TIME it happened to you and YOUR AGE when the event FIRST OCCURRED.

	Experienced Event in Lifetime		Number of Times Occurred	Age First Occurred
	Yes	No	#	Age
1. Were you ever in a disaster - for example, a flood or flash flood, tornado, fire, drought, or explosion?	☐	☐		
2. Were you ever in a life-threatening accident?	☐	☐		
3. Have you ever witnessed a serious accident or disaster where someone else was hurt very badly or killed?	☐	☐		
4. Have you ever had direct combat experience in a war?	☐	☐		
5. Have you ever been raped, or did you ever have sex when you didn't want to because someone forced you in some way, or threatened to harm you if you didn't? (If this happened at a time when you were growing up, it could be just because you thought you had to.)	☐	☐		
6. Were you ever touched or made to touch someone else in a sexual way because they forced you in some way, or threatened to harm you if you didn't?	☐	☐		
7. Were you ever physically abused or hurt by your parent or a caregiver?	☐	☐		
8. Were you ever physically abused or hurt by a spouse or a boyfriend/ girlfriend?	☐	☐		
9. Were you ever physically abused or hurt by someone else you knew?	☐	☐		
10. Have you ever seen violence between other members of your family? This would include your family when you were growing up, and your family now.	☐	☐		
11. Have you ever seen your mother being physically abused or hurt by a spouse or boyfriend/girlfriend?	☐	☐		
12. Have you ever seen your father being physically abused or hurt by a spouse or boyfriend/girlfriend?	☐	☐		
13. Other than the kinds of situations just mentioned, were you ever robbed, mugged, or physically attacked? (This would not include sexual attacks.)	☐	☐		
14. Have you ever witnessed someone else being raped, or badly injured or killed? (Other than the situations you've just described.)	☐	☐		
15. Have you ever had any other experiences like the ones we've been talking about? (IF YES: Please describe below.)	☐	☐		
16. Was someone close to you ever in a life threatening situation other than illness?	☐	☐		
17. Was someone close to you ever raped or sexually abused?	☐	☐		
18. Has your mother died?	☐	☐		
19. Has your father died?	☐	☐		
20. Did a family member or someone close to you ever commit suicide? (If No, go to #21.)	☐	☐		
20a. If YES, at the time, did you believe that you or someone else could be killed or seriously harmed?	☐	☐		
20b. If YES, at the time, were you seriously harmed or was anyone else killed or seriously harmed?	☐	☐		
21. Was a family member or someone close to you ever murdered?	☐	☐		
22. Did a family member or someone close to you ever die in a car crash?	☐	☐		
23. Please describe any other traumatic even you may have experienced.	☐	☐		

38. If you answered YES to any of the traumatic events listed above, please answer the following questions. The following are symptoms that people sometimes have after experiencing, witnessing, or being confronted with a traumatic event. Please read each one carefully and respond according to how much the symptoms have bothered you since the traumatic event/or the most recent traumatic event noted above. **If you report any of the PTSD symptoms listed below, we encourage you to please take the time to talk to a tribal society member or tribal school counselor.**

	Not at All	Rarely	Sometimes	Most of the Time
Recurrent thoughts or memories of the event	☐	☐	☐	☐
Feelings as though the event is happening again	☐	☐	☐	☐
Recurrent nightmares about the event	☐	☐	☐	☐
Sudden emotional or physical reactions when reminded of the event	☐	☐	☐	☐
Avoiding activities that remind you of the event	☐	☐	☐	☐
Avoiding thoughts or feelings associated with the event	☐	☐	☐	☐
Feeling jumpy, easily startled	☐	☐	☐	☐
Feeling on guard	☐	☐	☐	☐

39. Over the PAST 6 MONTHS, how often have you been bothered by the following problems?

	Not at All	Several Days	More than Half the Days	Nearly Every Day
Feeling nervous, anxious or on edge	☐	☐	☐	☐
Not being able to stop or control worrying	☐	☐	☐	☐
Worrying too much about different things	☐	☐	☐	☐
Trouble relaxing	☐	☐	☐	☐
Being so restless that it is hard to sit still	☐	☐	☐	☐
Becoming easily annoyed or	☐	☐	☐	☐
Feeling afraid as if something awful might happen	☐	☐	☐	☐

40. Has anyone close to you ever died?

☐ Yes

☐ No (If No, go to question #41)

40a. The following statements ask about different thoughts and feelings many people have when they are dealing with the death(s) of someone they have cared about. THINKING ABOUT THE DEATH THAT HAS BEEN HARDEST FOR YOU TO DEAL WITH for each statement, mark the response that tells how often it has happened during the PAST MONTH (4 WEEKS). Please answer every question that you can.

	Never	Rarely	Sometimes	Often	Almost Always
I miss the person who died.	☐	☐	☐	☐	☐
I don't do things because they remind me of how the person died.	☐	☐	☐	☐	☐
I enjoy good memories of him/her.	☐	☐	☐	☐	☐
Hearing someone talk about the person makes me think of the way he/she died.	☐	☐	☐	☐	☐
I feel like a big part of me has died with him/her.	☐	☐	☐	☐	☐
I feel sad about the person's death.	☐	☐	☐	☐	☐
I feel guilty about the person's death.	☐	☐	☐	☐	☐
Life for me doesn't have much purpose since he/she died.	☐	☐	☐	☐	☐
Upsetting thoughts about how the person died keep me from enjoying good memories of him/her.	☐	☐	☐	☐	☐
I get angry when I think about the person who died.	☐	☐	☐	☐	☐
My life feels empty without him/her.	☐	☐	☐	☐	☐
I try not to think about the person because I get upset remembering how he/she died.	☐	☐	☐	☐	☐

41. If you report any of the symptoms of depression or anxiety listed below, we encourage you to please take the time to talk to a tribal society member or tribal school counselor. Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way in the PAST 6 MONTHS.

	Rarely or None of the Time	Some of or A Little of the Time	Occasionally or a Moderate Amount of Time	Most or All of the Time
I felt that I could not shake off the blues, even with the help of my family and friends.	☐	☐	☐	☐
I felt depressed.	☐	☐	☐	☐
I thought my life had been a failure.	☐	☐	☐	☐
I felt fearful.	☐	☐	☐	☐
I felt lonely.	☐	☐	☐	☐
I had crying spells.	☐	☐	☐	☐
I felt sad.	☐	☐	☐	☐
I was bothered by things that usually don't bother me.	☐	☐	☐	☐
I did not feel like eating; my appetite was poor.	☐	☐	☐	☐
I felt I was just as good as other people.	☐	☐	☐	☐
I had trouble keeping my mind on what I was doing.	☐	☐	☐	☐
I felt that everything I did was an effort.	☐	☐	☐	☐
I felt hopeful about the future.	☐	☐	☐	☐
My sleep was restless.	☐	☐	☐	☐
I was happy.	☐	☐	☐	☐
I talked less than usual.	☐	☐	☐	☐
People were unfriendly.	☐	☐	☐	☐
I enjoyed life.	☐	☐	☐	☐
I felt that people dislike me.	☐	☐	☐	☐
I could not get "going."	☐	☐	☐	☐

42. You're almost done! We would like to look at some of your positive strengths. The next series of questions asks about gratitude and resilience.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I have so much in life to be thankful for.	☐	☐	☐	☐	☐	☐	☐
If I had to list everything that I felt grateful for, it would be a very long list.	☐	☐	☐	☐	☐	☐	☐
When I look at the world, I don't see much to be grateful for.	☐	☐	☐	☐	☐	☐	☐
I am grateful to a wide variety of people.	☐	☐	☐	☐	☐	☐	☐
I realize I have a lot in my life to appreciate.	☐	☐	☐	☐	☐	☐	☐
Long amounts of time can go by before I feel grateful for something or someone.	☐	☐	☐	☐	☐	☐	☐

42a. Please read the following statements. Click the circle that best indicates your feelings about that statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I usually manage one way or another	☐	☐	☐	☐	☐	☐	☐
I feel proud that I have accomplished things in life	☐	☐	☐	☐	☐	☐	☐
I usually take things in stride	☐	☐	☐	☐	☐	☐	☐
I am friends with myself	☐	☐	☐	☐	☐	☐	☐
I feel that I can handle many things at a time	☐	☐	☐	☐	☐	☐	☐
I am determined	☐	☐	☐	☐	☐	☐	☐
I can get through difficult times because I've experience difficulty before	☐	☐	☐	☐	☐	☐	☐
I have self-discipline	☐	☐	☐	☐	☐	☐	☐
I keep interested in things	☐	☐	☐	☐	☐	☐	☐
I can usually find something to laugh about	☐	☐	☐	☐	☐	☐	☐
My belief in myself gets me through hard times	☐	☐	☐	☐	☐	☐	☐
In an emergency, I'm someone people can generally rely on	☐	☐	☐	☐	☐	☐	☐
My life has meaning	☐	☐	☐	☐	☐	☐	☐
When I'm in a difficult situation, I can usually find my way out of it	☐	☐	☐	☐	☐	☐	☐

43. Here are the LAST three questions and a place for comments!!

	Not at All	Somewhat	A Great Deal
Completing this survey made me feel upset.	☐	☐	☐
Completing this survey was worth the time.	☐	☐	☐
I felt free to skip questions or to stop at any time.	☐	☐	☐

Please feel free to make any comments about the survey or to provide any other important information below.

THANK YOU!!!!!!!!!!

If you report symptoms of depression, anxiety, or PTSD or suicidal thoughts or behaviors, we encourage you to please take the time to talk to a tribal society member or tribal school counselor.