THE POWER OF PROTECTION: A POPULATION-BASED COMPARISON OF NATIVE AND NON-NATIVE YOUTH SUICIDE ATTEMPTERS

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Abstract: This study provides actionable information about intervening with American Indian/Alaska Native (AI/AN) youth to prevent suicide. Statewide school survey data were used to model the impact of risk and protective factors on self-reported suicide attempts (both AI/AN and non-AI/AN). The cumulative risk and protective model worked similarly for both groups. AI/AN youth had a higher threshold of risk before making a suicide attempt. Protective factors buffered the impact of risk, particularly for the higher risk youth.

INTRODUCTION

The high rates of American Indian and Alaska Native (AI/AN) youth suicide are devastating for individuals, families, and communities. Suicide is the second leading cause of death for AI/AN youth ages 10 to 24 years, while it is the third leading cause of death, across all racial groups, for youth in that age category (Centers for Disease Control and Prevention [CDC], 2005a, 2005b).[1] For the years 2005 to 2009, suicide rates for AI/AN youth ranged from 8 per 100,000 (female) to 24 per 100,000 (male). During the same period, White youth had the next highest suicide rates: for females, 3 per 100,000, and 11 per 100,000 for males (CDC, 2011).

Suicide *attempts* are similarly high among AI/AN youth. One study of over 13,000 AI/AN youth ages 12 to 18 years found that 22% of girls and 12% of boys attending reservation-based schools reported ever attempting suicide (Borowsky, Resnick, Ireland, & Blum, 1999). Another study found that 16% of AI/AN youth reported attempting suicide in the previous 12 months (Shaughnessy, Doshi, & Everett Jones, 2004). This finding compares with 9% of youth from the general population who reported attempting suicide in the past 12 months (Grunbaum et al., 2002).

Purpose of this Study

Suicidal behavior among AI/AN youth is a dire issue with epidemic proportions in many AI/AN communities. Numerous studies over the past two decades have tried to elucidate the underlying factors that lead to such behavior (Borowsky et al., 1999; Hallett, Chandler, & Lalonde, 2007; Manson, Beals, Dick, & Duclos, 1989; May, Serna, Hurt, & DeBruyn, 2005; Novins, Beals, Roberts, & Manson, 1999; Pettingell et al., 2008; Shaughnessy et al., 2004; Yoder, Whitbeck, Hoyt, & LaFromboise, 2006). However, there is a distinct disconnect between research and the ability to effectively communicate knowledge gained through research to staff, especially non-clinical staff, working directly with AI/AN youth in complex socioeconomic environments.[2] This gap may be due at least partially to the (understandable) tendency of researchers to design their studies with an eye to academic debates in the existing literature, rather than to what questions might best be translated into actionable information for practitioners. However, two perspectives need not be mutually exclusive.

Therefore, the primary goal of this study is to address questions that can be readily translated into practice or policy by the practitioners (often with limited human and material resources) working with AI/AN youth. There are three main focus areas relevant to practitioners that underpin this study:

1. Identify and prioritize youth who need the most urgent attention,
2. Verify whether there are differences between AI/AN and non-AI/AN youth that would indicate different prevention or intervention approaches for practitioners who work with both AI/AN youth and youth of other ethnic/racial backgrounds, and
3. Determine whether the research results indicate specific prevention or intervention strategies.

These focus areas translate into the following research questions:

1. What are the risk and/or protective factors that most strongly predict a suicide attempt?
2. Do increased numbers of risk factors (cumulative risk) relate to increased attempts and/or do more protective factors (cumulative protection) relate to fewer attempts?
3. Do risk and protective factors interact to create a buffering effect, whereby having protective factors protects against suicide attempts in the presence of risk factors?
4. Is there a threshold or critical number of risk factors above which youth are more likely to attempt suicide and/or a threshold of protective factors below which youth are less likely to attempt suicide?
5. Do risk and protection thresholds correctly identify youth at higher risk for a suicide attempt, or do they miss some youth?

6. Does combining risk and protective factor thresholds produce a more useful method for predicting youth suicide attempts?

The rationale for asking the specific research questions can be found in the theoretical approach, detailed below, as well as in the section on the contributions of this study.

Theoretical Approach

Our work draws from a wellness or strength-based perspective that is deeply resonant with the beliefs and practices of AI/AN peoples and communities. This approach aligns with the "transactional-ecological framework" (Alcantra & Gone, 2007; Felner & Felner, 1989), which highlights the complex interaction of people and their social ecology in order to understand suicidal behaviors. By not blaming the victim but, instead, looking at the interplay of youth and their social milieu, new, promising, and attainable approaches to prevention and intervention are revealed.

From this theoretical vantage point, the key is to look at the attributes of youth in their various life domains to understand the triggers of suicidal thoughts and behaviors. For many years, the emphasis of suicide research revolved around problems—or risks—facing youth. Generally speaking, these risk factors were located only in the individual domain: depression, risk seeking (e.g., using tobacco, drugs, and alcohol; precocious sexual behavior), and violent behaviors. In fact, the link between suicidal behaviors and these individual-level risks has been well documented elsewhere (for a full review of the literature, see Berman, Jobes, & Silverman, 2006, and/or Gould, Greenberg, Velting, & Shaffer, 2003). Virtually all the literature on youth suicide, including AI/AN youth suicide, shows that emotional and psychological distress are key risk factors.

Unfortunately, focusing only on the risks youth face—and only on individual youth—completely denies both the positive individual attributes (e.g., strong self-esteem, optimism about the future) and positive attributes outside the individual (e.g., supportive family, teachers, community members) which have been shown to protect youth from adverse outcomes such as suicidal thoughts and behaviors.

It is no coincidence that much of the work to bring protective factors into the discussion has been led by the strengths-based approach of AI/AN researchers and/or researchers hoping to extend insights into the reasons for—and possible interventions to protect against—suicidal thoughts and behaviors among AI/AN youth.

Risk and Protective Factors within Life Domains

The groundbreaking work of Catalano and Hawkins (1996) puts into practice the transactional-ecological approach by conceptualizing both risk and protective factors in five life domains for youth: individual, peer, family, school, and community. Just as risk factors for youth

dropping out of school, getting involved with drugs and alcohol, or showing suicidal thoughts and behaviors can be found among these five domains, so, too, are there factors in these domains that can protect youth against poor outcomes.

Including both risk and protective factors over the various life domains provides a more holistic approach to understanding youth suicidal thoughts and behaviors (Borowsky, Ireland, & Resnick, 2001; Elliot, Colangelo, & Gelles, 2005; Fleming, Merry, Robinson, Denny, & Watson, 2007; Garcia, Skay, Sieving, Naughton, & Bearinger, 2008; Kidd et al., 2006; Randell, Wang, Herting, & Eggert, 2006). More specifically, including protective factors contributes to a holistic understanding of the suicidal thoughts and behaviors of AI/AN youth, as well as to the development of appropriate interventions (Borowsky et al., 1999; Hallet et al. 2007; Joe, Canetto, & Romer, 2008; Leach, 2006; Mignone & O'Neil, 2005; Pettingell et al., 2008; Strickland, Walsh, & Cooper, 2006). Table 1 organizes—by each life domain—a number of risk factors which have been linked by research to youth suicidal thoughts and behaviors. Table 2 lists protective factors which have been associated by research with suicidal thoughts and behaviors in each life domain.

As much as possible, the current study includes these risk and protective factors. Although not all previously identified risk and protective factors were available on the statewide survey used to gather data from youth in the present study, risk factors from all five life domains were still available, as well as protective factors from three of the five life domains.

Table 1
Risk Factors* Associated with Youth Suicide Attempts

Individual Attributes
Prior suicide attempt
Alcohol and/or illicit drug use
Tobacco use
Violence perpetration
Early sexual activity/high-risk sex
Depressed state and/or poor emotional health
Same-sex romantic attraction
Violence victimization (being physically or sexually abused, being bullied, intimate partner violence)
Gun availability/weapon carrying
Somatic symptoms (headaches, stomach problems, nerves) and/or poor physical health
Family Attributes
Friend/family attempt or completed suicide
Family conflict or violence
Family alcohol and/or drug use

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Table 1, Continued
Risk Factors* Associated with Youth Suicide Attempts

Peer Attributes
Lack of friends
Gang involvement
School Attributes
Academic problems
Community Attributes
Living in an impoverished neighborhood

* Factors used in the current study are italicized; not all risk factors used in this study are on the list (e.g., living in a neighborhood characterized by crime)

Table 2
Protective Factors* Associated with Reduced Youth Suicide Attempts

Individual Attributes
Individual resilience (self-esteem, self-efficacy, etc.)
Life satisfaction
Abstaining from sexual activity
Positive mood/emotional health
Religious identity
Family Attributes
Family support for school
Family - general satisfaction with family support/connectedness and/or "mattering"
Parental prosocial norms
Able to discuss problems with friends or family
Peer Attributes
Peer social support
School Attributes
Academic achievement
School connectedness
Having caring teachers
Community Attributes
Connectedness to community
Cultural continuity

* Factors used in the current study are italicized; not all protective factors used in this study are on the list (e.g., eating breakfast)

Contributions of this Study

Building upon the ecological model that incorporates risk and protective factors for youth suicide identified above, this study differs from previous research in three ways: 1) It looks at data from a statewide survey of the general youth population rather than in specifically AI/AN schools or areas where Native peoples are concentrated, 2) The statewide survey data allow us to compare AI/AN youth with non-Native youth to see if variables act and interact differently for these two groups, and 3) Analytical contributions that arise from the desire to provide staff and volunteers working with AI/AN youth (and, likely, all youth) can give useful information about identifying and intervening with youth who may be at risk for suicide attempts.

The General Population Approach

While much of the literature that deals with the relationship between risk and protective factors and AI/AN youth suicide is based upon youth in reservation schools (Shaughnessy et al., 2004; Borowsky et al., 1999; Grossman, Milligan, & Deyo, 1991; LaFromboise & Hayes, 2008; Manson et al., 1989; Novins et al., 1999) or in urban schools that have high concentrations of AI/AN youth (Pettingell et al., 2008), our study examines data from youth across the state of Oregon. This difference allows us to observe a potentially different group of AI/AN youth: Because no tribal/Bureau of Indian Affairs (BIA) schools are in this sample, these data are for AI/AN youth who are interspersed with the population at large, and who, therefore, may be more representative of AI/AN youth across the U.S. than those in studies focusing on tribal/BIA school populations.[3]

Analytical Contributions

This study sought to build upon the analytical techniques found in previous research in several ways. First, previous research has looked at the impact of individual risk factors (e.g., Miller & Taylor, 2005) or cumulative risk (e.g., Shaughnessy et al., 2004). Analysis for the current study, using 24 risk factors, calculates risk *thresholds* to understand how many risk factors a youth must have before becoming statistically more likely to attempt suicide. This intuitive and practical way to understand how cumulative risk works results in actionable steps that staff and providers can use in working with youth.

Second, similar analyses for the protective factors were included in the study. A protection threshold was calculated to understand how many protective factors youth had before they became significantly less likely to report attempting suicide. It does not appear that this calculation has previously been done with respect to youth suicidal ideation. Therefore, this study provides user-friendly and potentially useful screening information for practitioners.

Third, this study looks at the effects of both risk and protective factors in combination. Previous studies (Borowsky et al., 1999; Pettingell et al., 2008) found that adding at least one protective factor to existing risk factors reduced the likelihood of a past suicide attempt. By conducting a similar analysis with more risk and protective factors than either of the earlier studies with AI/AN youth, this study is able to expand the scope of how risk and protective factors work together and compare the different variations of risk and protection for both AI/AN and non-AI/AN youth reporting a suicide attempt.

AI/AN and Non-AI/AN Youth Comparison

Given the concern about high rates of suicidal thoughts and behaviors among Native youth, it is not surprising that there are a host of studies focusing solely upon this group. On the other hand, it is important to learn whether risk and protective factors are different for AI/AN and non-AI/AN youth, and/or whether the relationship between risk and protective factors is different for AI/AN and non-AI/AN youth. For a state like Oregon (and many others) where AI/AN youth are as likely to be interspersed in the general population in both urban or rural areas as they are to live in predominantly tribal communities, it is important to provide specific information about working with AI/AN youth to professionals who do not have training with this population.

Of all the research that explores risk and protective factors for suicide for AI/AN youth, no prior studies develop specific models for both AI/AN and non-AI/AN youth. In fact, many studies leave Native youth out altogether, or lump them into an "other" category with culturally and ethnically different groups (e.g., Eaton et al., 2008; Gutierrez, Rodriguez, & Garcia, 2001). AI/AN researchers have been calling for more studies to demonstrate that the same risk and protective factors are, in fact, common to both Native and non-Native youth (Joe et al., 2008). By using a statewide sample of youth, this study is able to examine whether risk and protective factors work separately (and together) in the same way or differently for both AI/AN and non-AI/AN youth.

METHODS

This study analyzed Oregon Healthy Teens (OHT) Survey data, which were obtained from the Center for Health Statistics in the Public Health Division of Oregon's Department of Human Services. The OHT Survey is an anonymous, voluntary, school-based survey conducted annually among 8th and 11th graders statewide that is used to monitor the health and well-being of Oregon youth. Although the survey is predominantly administered to 8th and 11th graders, there were students in the sample who reported being in grades 9, 10, and 12. These additional grades appear when schools volunteer to survey students in those grades and when OHT collaborates with the CDC on the Youth Risk Behavior Survey, which requires participation from a subsample of students in grades

8 through 12 in even-numbered years.[4] Depending on the year, the topics covered on the OHT Survey include tobacco, alcohol, and other drug use; access to tobacco and alcohol; violence-related behaviors; diet and exercise; extracurricular activities; sexual activity and HIV/AIDS knowledge; and individual, peer, community, and family influences on risk behaviors.

Selecting Risk and Protective Factors

The research team reviewed all items on the 2006 OHT Survey and identified 132 variables (from a pool of over 200) for initial consideration based on a priori knowledge of risk and protective factors associated with suicide attempts.

Correlations were calculated between all 132 initial variables and reported suicide attempts, and the 62 variables with correlations having an absolute value of .15 or greater (i.e., that accounted for approximately 2% of the variation in reported suicide attempts) were selected for further analyses. Of the 62 variables selected, 41 were combined to create eight scales and the remaining 21 were used as single-item indicators (resulting in 24 risk factors and 5 protective factors). Appendix A lists all items from the OHT Survey comprising the final set of risk and protective factors, including the 41 items that became scales. Appendix B provides the details for scale creation.

In the literature on risk and protective factors, it is often the case that risk factors are the opposite of protective factors or vice versa. In this study, the authors used caution when selecting the risk and protective factors and did not "double-dip": For example, good grades were not used as a protective factor at the same time that bad grades were used as a risk factor; good grades were used strictly as a protective factor and did not have an associated risk factor. The only potential conflicts might be general health (good/excellent) and general mental health (bad). However, these were considered different enough constructs to be used separately. While this usage is not ideal, the authors did try to make the best use of the data available.

Creating a Risk and Protective Factor Checklist from OHT Data

Risk and protective factor assessments are typically checklists with each factor being a dichotomous variable (yes/no); cumulative scores are computed by summing the number of indicated risk or protective factors. Ten of the original indicators of risk/protection from the OHT Survey were dichotomous, and the remaining 19 indicators were measured on an interval scale.[5] The final set of 24 risk and 5 protective factors cover four of the five life domains identified by Catalano and Hawkins (1996): individual (e.g., emotional health, physical abuse), family (e.g., parents approve of substance use), peer (e.g., extent to which friends are involved in problem behavior), and community (e.g., crime and safety in one's neighborhood).

RESULTS

Description of Participants

The current study focuses on a subset of youth having complete data on the 24 risk and 5 protective factors of interest and the outcome variable, whether or not the youth attempted suicide in last 12 months (n = 11,154). As shown in Table 3, just over half of the participants (56%) were male. The average age was 15 years (range, 12-18 years; *SD* = 1.56), with most youth attending either 8th or 11th grade. The majority of youth were White, and the largest racial group was Hispanic/Latino, mirroring Oregon's population overall (U.S. Census Bureau, 2008-2010). For this study, racial groups were collapsed into AI/AN status, in which 5% self-identified as AI/AN and 95% were non-AI/AN. Youth were included in the AI/AN group even if they also selected other racial or ethnic identities, a practice mirrored in the 2010 Census (U.S. Census Bureau, 2012). Oregon's most recent 3-year estimate for the AI/AN population, alone or in combination with other racial/ethnic categories, is 3% ±3% (U.S. Census, 2008-2010). Most youth (95%) identified as heterosexual.[6]

Table 3
Survey Respondent Demographic Characteristics

Characteristic	Percentage (Number of Youth)	Reported Suicide Attempt in Past Year Percentage (Number of Youth)
Gender		
Male	56.0% (6,251)	2.9% (141)
Female	44.0% (4,903)	7.8%[1] (487)
Ethnicity		
White	77.4% (8,695)	5.3% (457)
Hispanic/Latino	8.8% (979)	5.0% (49)
American Indian/Alaska Native[2]	4.5% (503)	10.5%[1] (53)
Multiethnic	3.7% (409)	8.6% (35)
Asian	3.2% (362)	4.4% (16)
African American	1.4% (158)	5.7% (9)
Pacific Islander/Native Hawaiian	0.9% (98)	9.2% (9)
Grade		
8th	46.9% (5,227)	6.6% (345)
9th	0.5% (60)	5.0% (3)
10th	0.9% (95)	7.4% (7)
11th	51.1% (5,700)	4.8% (272)
12th	0.6% (72)	1.4% (1)

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Table 3, Continued
Participant Demographic Characteristics

Characteristic	Percentage (Number of Youth)	Reported Suicide Attempt in Past Year Percentage (Number of Youth)
Sexual Identity (n = 5,260)[3]		
Heterosexual	94.8% (5,590)	3.9% (220)
Gay, lesbian, bisexual, unknown	5.2% (304)	20.7%[1] (63)

[1] Group with significantly higher proportion of suicide attempts
[2] The American Indian/Alaska Native category includes multiethnic youth
[3] The item asking about sexual identity has a smaller n because it is on the 11th-grade survey only

Prevalence of Suicide Attempts

In this sample of youth, 5.6% (n = 628) reported attempting suicide at least once in the past 12 months. This percentage is slightly lower than that for the 2006 sample as a whole (N = 25,997), in which 6.2% (n = 1,606) reported attempting suicide in the past 12 months, and it is lower than the national percentage (6.9%) of youth reporting a suicide attempt during the past 12 months in 2007 (Eaton et al., 2008).

Reported suicide attempts in the past 12 months differed significantly according to gender, AI/AN status, and sexual identity. As shown in Table 3, the following subgroups of youth were more likely to have reported a suicide attempt: girls ($X^2 = 124.93$, $p < .001$), AI/AN youth (compared to all other youth, $X^2 = 23.87$, $p < .001$), and sexual minority youth ($X^2 = 177.78$, $p < .001$). Both AI/AN and non-AI/AN girls were more likely to have reported a suicide attempt than boys, but the difference was statistically significant for non-AI/AN youth only (AI/AN: 12.4%, n = 36 for girls vs. 8.0%, n = 17 for boys, $X^2 = 2.47$, ns; non-AI/AN: 7.6%, n = 451 for girls vs. 2.6%, n = 124 for boys, $X^2 = 124.61$, $p < .001$). There was also a small effect for age, such that younger students tended to report at least one suicide attempt in the past 12 months, F (1, 11,099) = 12.31, $p < .001$.

Strongest Predictors of Suicide Attempts

All 29 predictors (24 risk and 5 protective) included for analysis were significantly related (correlations > .15) to the likelihood of a reported suicide attempt. To determine which risk and protective factors were *most strongly* related to reported suicide attempts, a stepwise logistical regression was calculated (separately for AI/AN and non-AI/AN youth) using the forward conditional variable entry method. This method enters variables into the model based on the significance of the score statistic, and removes variables based on whether model fit would change significantly

if the variable were removed. This type of modeling is a data-driven approach to determining the strongest unique predictors of an outcome based on the available predictors. Due to large sample size differences, the entry criteria for AI/AN youth was $p < .05$, and for non-AI/AN youth was $p < .001$. The first step of the model contained gender and grade as covariates.

In Table 4, the risk and protective factors are sorted from largest to smallest odds ratio for AI/AN and non-AI/AN youth. For AI/AN youth, the five strongest predictors of reported suicide attempts were:

1. Feeling so sad or hopeless in the last 2 weeks that you stopped participating in usual activities,
2. Having an emotional condition such as anxiety or depression,
3. Not eating breakfast 7 out of the last 7 days,
4. Ever being intentionally hit or physically hurt by an adult, and
5. Ever having had sexual contact with an adult.

For non-AI/AN youth, the five strongest predictors of reported suicide attempts were:

1. Scoring 2.6 or higher on Beck Depression Inventory (Beck & Steer, 1984; see Appendix B for scoring information),
2. Feeling so sad or hopeless in the last two weeks that you stopped participating in usual activities,
3. Being physically forced to have sexual intercourse when you did not want to,
4. Attacking someone with the intent to seriously injure them in the past 12 months, and
5. Having an emotional condition such as anxiety or depression.

Table 4
Stepwise Logistic Regression Model of Risk and Protective Factors Uniquely Related to Reported Suicide Attempts by AI/AN Status

AI/AN Youth				Non-AI/AN Youth			
Predictor*	**b**	**Odds Ratio**	**95% Confidence Interval for Odds Ratio**	**Predictor**	**b**	**Odds Ratio**	**95% Confidence Interval for Odds Ratio**
Gender (0 = female, 1 = male)	1.32	3.72	1.37, 10.11	Gender (0 = female, 1 = male)	-0.45	0.64	0.50, 0.81
Grade	-0.33	0.72	0.52, 0.99	Grade	-0.17	0.84	0.78, 0.91
Sad 2 or more weeks in past year	2.20	8.99	3.42, 23.62	Beck Depression Inventory	1.28	3.61	2.74, 4.76

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Table 4
Stepwise Logistic Regression Model of Risk and Protective Factors Uniquely Related to Reported Suicide Attempts by AI/AN Status

AI/AN Youth				Non-AI/AN Youth			
Predictor*	**b**	**Odds Ratio**	**95% Confidence Interval for Odds Ratio**	**Predictor**	**b**	**Odds Ratio**	**95% Confidence Interval for Odds Ratio**
Emotional condition such as anxiety or depresson	2.01	8.01	3.38, 18.98	Sad 2 or more weeks in past year	1.20	3.30	2.63, 4.16
Ate breakfast 7 out of past 7 days	-1.60	0.20	0.08, 0.52	Ever physically forced to have sexual intercourse	0.78	2.18	1.61, 2.95
Ever intentionally hit or physically hurt by adult	1.56	4.75	1.93, 11.69	Attacked someone in past 12 months	0.75	2.12	1.65, 2.72
Ever had sexual contact with adult	1.29	3.62	1.45, 9.03	Emotional condition such as anxiety or depression	0.73	2.08	1.66, 2.60
Did not go to school because felt unsafe in past 30 days	1.16	3.19	1.10, 9.28	Prescription drug use in past 30 days	0.73	2.07	1.53, 2.80
Very good or excellent physical health	-1.01	0.36	0.14, 0.97	Inhalant use in past 30 days	0.67	2.08	1.40, 2.71
Driving in a car after self or other driver drank alcohol in past 30 days	0.99	2.68	1.16, 6.17	Ever intentionally hit or physically hurt by adult	0.52	1.69	1.37, 2.09
				Harassed in past 30 days	0.48	1.62	1.30, 2.02
				Unmet emotional or mental health needs in past year	0.48	1.61	1.29, 2.02
				Ate breakfast 7 out of past 7 days	-0.47	1.60	0.51, 0.77
				Can work out problems if I try	-0.39	0.68	0.54, 0.85
Model fit at final step 8		$p < .001$	$R^2 = .60$	Model fit at final step 12		$p < .001$	$R^2 = .43$

* Risk and protective factors are sorted so that the strongest indicators are presented first. All risk and protective factors were significant at least $p < .05$ for AI/AN youth and $p < .001$ for non-AI/AN youth.

Thus, depression and other types of emotional or mental health issues were strong predictors of reported suicide attempts in both groups; however, the other strong predictors for AI/AN youth had to do with the stability of and/or abuse from adults in their lives; for non-AI/AN youth, these predictors were acting-out behaviors like substance use and violence.

Cumulative Risk and Protection

Cumulative risk and protection scores are commonly calculated to identify which youth are most at risk for suicide attempts. To determine the extent to which cumulative risk and protection was related to reported suicide attempts, the total number of risk factors (0 to 24) and protective factors (0 to 5) were counted for all youth in the sample. On average, youth had 4.8 (SD = 4.09) risk factors and 3.6 (SD = 1.23) protective factors. The numbers of risk and protective factors were moderately correlated (r = -.45), suggesting that having more risk factors was associated with having fewer protective factors. Although related, the moderate correlation suggests that risk and protective factors also operate independently.

It was found that youth who reported a suicide attempt in the past 12 months had a significantly higher number of risk factors, M = 11.6, SD = 4.50, n = 628 than those who did not report an attempt, M = 4.4, SD = 3.68, n = 10,526, t(677.97) = -39.28, p < .001. Youth who reported a suicide attempt in the past 12 months also had a significantly lower number of protective factors (M = 2.4, SD = 1.33, n = 628) than those who did not report an attempt, M = 3.6, SD = 1.19, n = 10,526, t(688.02) = 22.18, p < .001.

Does Cumulative Risk and Protection Differ According to AI/AN Status?

On average, AI/AN youth had 6.4 (SD = 4.75, n = 503) risk factors and 3.3 (SD = 1.32) protective factors, whereas non-AI/AN youth had an average of 4.7 (SD = 4.03, n = 10,651) risk factors and 3.7 (SD = 1.23) protective factors. Both of these comparisons were statistically significant, t(536.71) = -8.12, p < .001 and t(543.79) = 4.62, p < .001, respectively. Although there were mean-level differences *between* groups, there was a great deal of variation *within* groups, as evidenced by the fact that both groups had the full range of very low (0) to very high (over 20) risk factors, and very low (0) to very high (5) protective factors (see Figure 1 and Figure 2).

Figure 1
Distribution of Cumulative Risk Factors among AI/AN and Non-AI/AN Youth

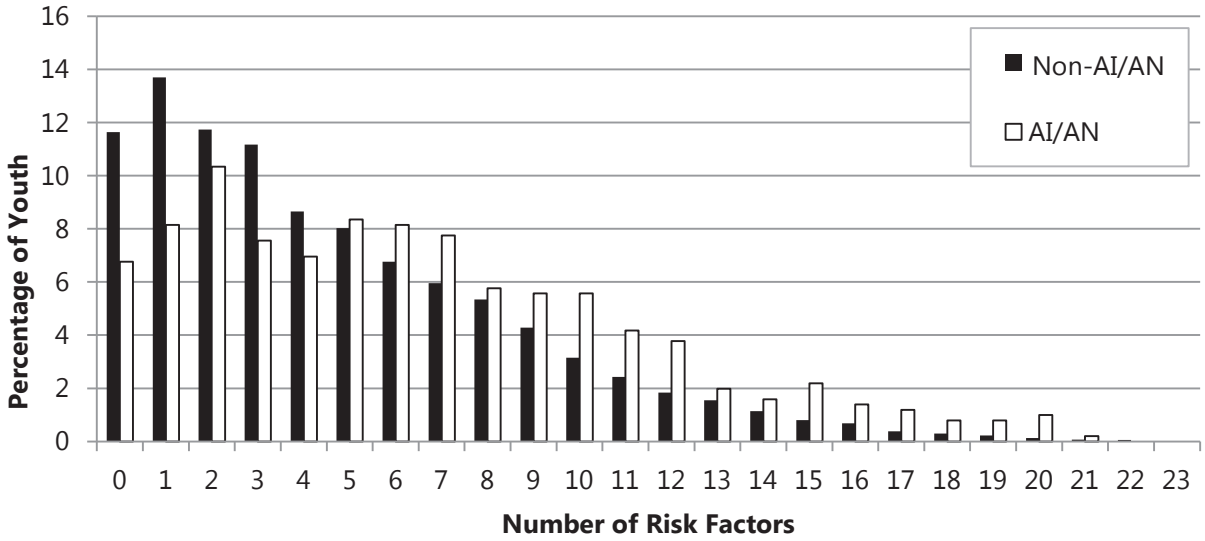
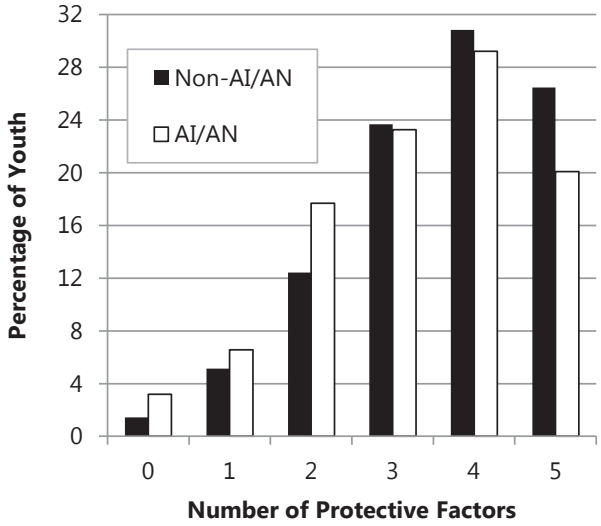


Figure 2
Distribution of Cumulative Protective Factors among AI/AN and Non-AI/AN Youth



The Buffering Effect

A logistic regression model was built to test whether cumulative risk and protection interact, such that protective factors reduce the likelihood of a suicide attempt in the presence of risk factors. In the first step of the model, AI/AN status, grade, and gender were entered as covariates, and in the second step, total number of risk and total number of protective factors were entered. The third step contained an interaction term to test whether the effect of risk on reported suicide attempts was

moderated by protective factors (risk X protection). Cumulative risk and protection scores were centered and the interaction term was calculated by multiplying the grand mean-centered cumulative risk scores (Aiken & West, 1991). This study also tested whether the effects of risk and protection (and their interaction) were moderated by AI/AN status and found that these interactions were not statistically significant, and were, therefore, not included in the final model.

In the first step of the model (shown in Table 5), AI/AN youth, girls, and youth in earlier grades were more likely to have reported a suicide attempt. In the second and third steps of the model, AI/AN status was no longer statistically significant, suggesting that the relationship between AI/AN status and suicide attempts can be explained by level of risk and protection rather than something inherent about being Native.

Table 5
Logistic Regression Model of the Relationships between Risk, Protection, and AI/AN Status Predicting Reported Suicide Attempts

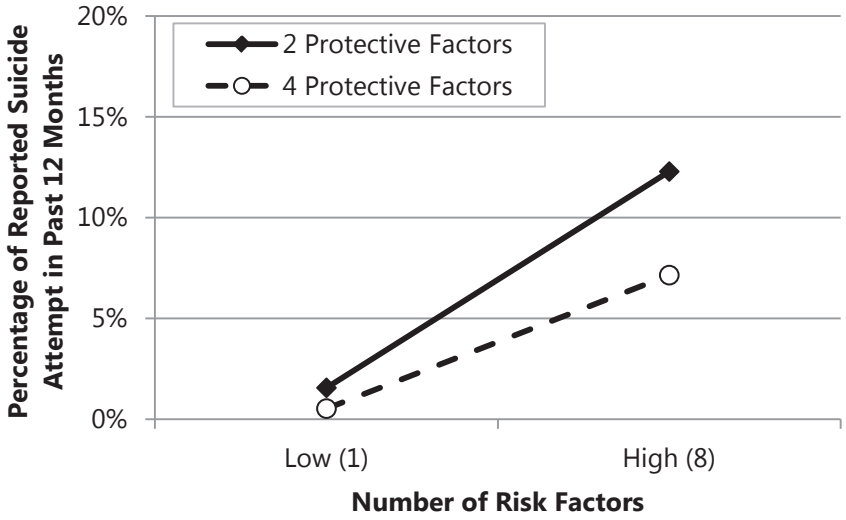
Predictor[1]	b	Odds Ratio	95% Confidence Interval for Odds Ratio
Step 1: X^2 = 167.61, p < .001			
AI/AN Status (1 = AI/AN)	0.69***	2.00	1.48, 2.70
Gender (1 = Male)	-1.04***	0.35	0.29, 0.43
Grade	-0.11***	0.90	0.85, 0.95
Step 2: X^2 = 1439.01, p < .001			
AI/AN Status (1 = AI/AN)	0.04	1.05	0.73, 1.50
Gender (1 = Male)	-0.53***	0.59	0.47, 0.73
Grade	-0.28***	0.75	0.71, 0.80
Total risk factors	0.32***	1.38	1.35, 1.42
Total protective factors	-0.24***	0.79	0.73, 0.85
Step 3: X^2 = 18.59, p < .001			
AI/AN Status (1 = AI/AN)	0.06	1.06	0.74, 1.52
Gender (1 = Male)	-0.52***	0.59	0.48, 0.73
Grade	-0.28***	0.75	0.71, 0.80
Total risk factors	0.35***	1.42	1.39, 1.46
Total protective factors	-0.42***	0.66	0.59, 0.74
Risk X Protection	0.04***	1.04	1.02, 1.05

[1] Chi-square statistics, unstandardized regression coefficients, and odds ratios taken from each step of the model

* p < .05
** p < .01
*** p < .001

Step 3 of the model indicates that the effect of risk on reported suicide attempts was moderated by total number of protective factors, as evidenced by a significant risk X protection interaction. When the interaction was graphed, a classic buffering effect emerged: When risk factors were low, having more protective factors did not have a marked effect on the relationship between risk and reported suicide attempts; however, as risk factors increased, having more protective factors was associated with a lower incidence of reported suicide attempts (see Figure 3). Thus, having more protective factors *buffered* the effect of risk factors on reported suicide attempts among those youth that were at higher risk.

Figure 3
Moderating Effect of Protective Factors on the Relationship between Risk Factors and Reported Suicide Attempts



Several main effects are worth noting as well. Even after accounting for all factors in the model, each additional risk factor was associated with a 42% increase, and each additional protective factor was associated with a 38% decrease, in the odds of reporting a suicide attempt compared to not reporting a suicide attempt. Additionally, the odds of having reported a suicide attempt decreased by 41% for boys compared to girls,[7] and 25% for each increase in grade (e.g., 8th to 9th grade). As previously mentioned, AI/AN status was not related to reported suicide attempts after controlling for gender and cumulative risk and protective factors.

Thresholds for Cumulative Risk and Protection

By establishing cumulative risk and protection thresholds, it may be possible to determine how many risk factors youth must have before they are statistically *more* likely to report attempting suicide, and how many protective factors must youth have before they are statistically *less* likely to

report attempting suicide. First, the proportion of students who reported a suicide attempt at each level of risk (0-24) and each level of protection (0-5) was graphed. Figure 4 shows that the likelihood of reporting a suicide attempt increases as the number of risk factors increase, especially after the risk factor count exceeds 10 for AI/AN youth and 8 for non-AI/AN youth. Figure 5 illustrates that the likelihood of reporting a suicide attempt decreases as the number of protective factors increase, and does so more dramatically for non-AI/AN youth.

Figure 4
Proportion of Youth with Reported Suicide Attempt According to Cumulative Number of Risk Factors by AI/AN Status

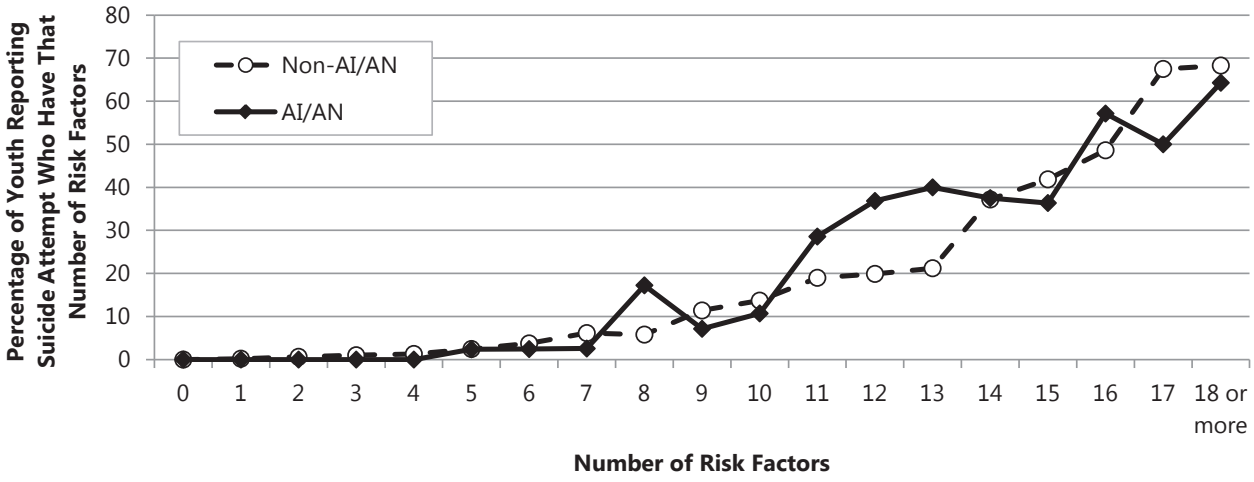
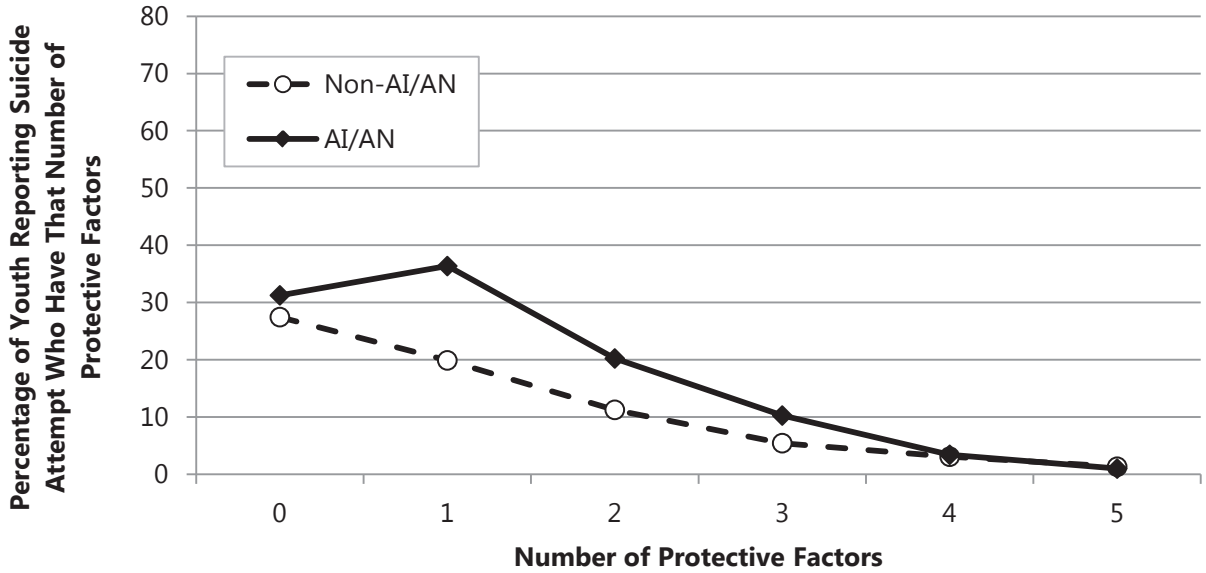


Figure 5
Proportion of Youth with Reported Suicide Attempt According to Cumulative Number of Protective Factors by AI/AN Status



Second, contingency tables (total risk factors X suicide attempt and total protective factors X suicide attempt) were examined separately for AI/AN and non-AI/AN youth. *Risk threshold* was defined as the number of risk factors for which significantly more youth than expected reported a suicide attempt in the past 12 months (as indicated by a standardized adjusted residual greater than 1.96). Similarly, the *protection threshold* is the number of protective factors for which significantly fewer youth than expected reported a suicide attempt in the past 12 months. Table 6 indicates that, although the protection threshold for both AI/AN and non-AI/AN youth was 4, the two groups differed on their risk threshold: 11 for AI/AN youth and 9 for non-AI/AN youth. Thus, it takes two additional risk factors before AI/AN youth are statistically more likely to report attempting suicide than are non-AI/AN youth.

Table 6
Thresholds for Risk and Protective Factors Predicting Reported Suicide Attempts

Group	Threshold Type	Threshold	Youth At or Above Threshold % (n)	True Positives[1] % (n)	False Negatives[2] % (n)
AI/AN	Risk	11	19.1% (96)	41.7% (40)	3.2% (13)
	Protection	4	49.3% (248)	18.4% (47)	2.4% (6)
Non-AI/AN	Risk	9	17.0% (1812)	23.3% (420)	1.8% (155)
	Protection	4	57.3% (6104)	9.6% (437)	2.3% (138)

[1] True Positives = Youth who scored *at or above the risk* threshold, or *below the protection* threshold, who reported a suicide attempt in the past 12 months
[2] False Negatives = Youth who scored *below the risk* threshold, or *above the protection* threshold, and reported an attempted suicide in the past 12 months

Third, the authors looked at how well the thresholds discriminated between youth who did and did not report a suicide attempt. As shown in Table 6, the proportion of youth who were true positives (youth who were predicted to have reported a suicide attempt by threshold and who actually did attempt) and false negatives (youth who were not predicted to report attempting and actually did) was examined for each threshold.

True Positives

Of the AI/AN youth who were at or above the threshold for risk (threshold = 11), 42% (n = 40) reported attempting suicide, compared to only 23% (n = 420) of the non-AI/AN youth (threshold = 9). The protection threshold was less effective at identifying true positives. Of the AI/AN youth who were below the protection threshold (less than 4), 18% reported a suicide attempt, compared to 10% of non-AI/AN youth.

False Negatives

Of the AI/AN youth who were *below* the threshold for risk, only 3% reported a suicide attempt, compared to 2% of non-AI/AN youth. A false negative for the protection threshold would be a youth who was at or above the protection threshold and also reported a suicide attempt. For both AI/AN and non-AI/AN groups, 2% of the youth were false negatives. Hence, the risk and protection thresholds produced very few false negatives.

Thresholds for Youth that Reported a Suicide Attempt

It is also interesting to look at how the thresholds operated for youth who reported a suicide attempt only; that is, the proportion of youth who reported a suicide attempt and were above the threshold for risk or below the threshold for protection. Of the AI/AN youth who reported a suicide attempt, 76% (40 out of 53) were at or above the threshold for risk, and 89% (47 out of 53) were below the threshold for protection. Of the non-AI/AN youth who reported a suicide attempt, 73% (420 out of 575) were at or above the threshold for risk, and 76% (437 out of 575) were below the threshold for protection. Thus, a similar proportion of AI/AN and non-AI/AN youth who reported a suicide attempt were at or above the risk threshold, but a larger proportion of AI/AN youth who reported a suicide attempt were below the protection threshold compared to non-AI/AN youth.

To better understand the youth that reported a suicide attempt but did not score above the risk threshold or below the protection threshold (n = 168), the most commonly reported risk and protective factors for this group were reviewed. It was found that more than half of these youth scored high on the Beck Depression Inventory scale (71%, n = 119), felt their general emotional health was less than good (70%, n = 118), were harassed in the past 30 days (59%, n = 99), felt they could work out their problems (67%, n = 112), helped make decisions with their families (67%, n = 112), and got A's or B's in school (68%, n = 114). The subset of AI/ANs within this group was too small to compare to non-AI/AN youth. These findings suggest that the combination of mental health issues (e.g., depression) *and* protective factors (e.g., resilient attitudes, family involvement, academic achievement) creates a unique profile for low-risk youth suicide attempters.

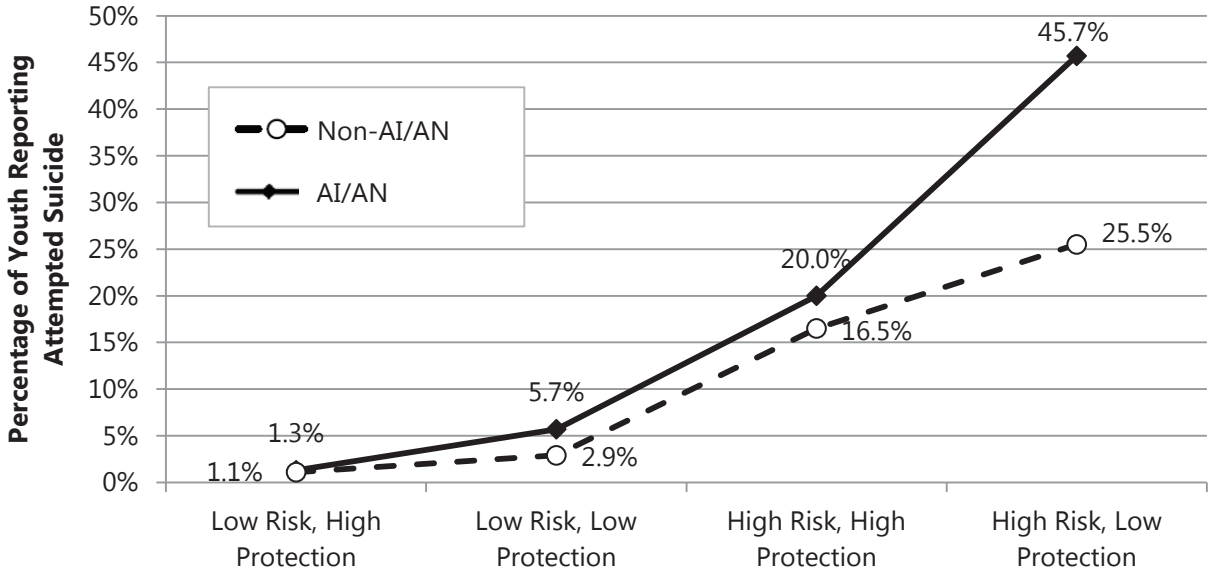
Combinations of Risk and Protection Thresholds

To determine whether combining the risk and protection thresholds provides more information about the likelihood of suicide attempts, a logistic regression model was built that controlled for grade, gender, and AI/AN status in the first step, included the risk and protective factor thresholds (dichotomous variables indicating whether each youth was above or below each threshold) in the second step, and included an interaction between risk and protection thresholds in the third step. A 3-way interaction was tested between risk threshold, protection threshold, and AI/AN status, but the

relationships were not significant. However, the interaction between risk and protection thresholds accounted for a significant amount of variation in reported suicide attempts ($X^2(1) = 7.19$, $p < .01$), suggesting that combining risk and protection thresholds does provide additional information when predicting suicide attempts.

To illustrate these relationships, four combinations of risk and protective factors were created based on being at or above (high) or below (low) each threshold: (1) low-risk, high-protection (52.6%, n = 5,869); (2) low-risk, low-protection (30.3%, n = 3,377); (3) high-risk, high-protection (4.3%, n = 483); and (4) high-risk, low-protection (12.8%, n = 1,425). Figure 6 shows the proportion of AI/AN and non-AI/AN youth having each combination (although AI/AN status did not statistically moderate the interaction between risk and protection thresholds). Starting with the low-risk, high-protection group, the proportion of youth with a reported suicide attempt increased slightly for the low-risk, low-protection group. The likelihood of reporting a suicide attempt increased more substantially for the high-risk, high-protection group, and there was another increase with the loss of protective factors for the high-risk, low-protection group.

Figure 6
Proportion of Youth with Reported Suicide Attempt According to Risk and Protection Combination Groups by AI/AN Status



AI/AN and non-AI/AN youth generally looked very similar with the exception of the high-risk, low-protection group. The loss of protective factors (i.e., moving from high-risk, high-protection to high-risk, low-protection) was associated with a larger increase in reported suicide attempts (from 20% to almost 46%) in AI/AN youth than in non-AI/AN youth (from 17% to 26%). To follow up on this finding, a post hoc chi-square comparison was conducted. Among the youth in the high-risk,

low-protection group, AI/AN youth were significantly more likely to have reported a suicide attempt than non-AI/AN youth ($X^2(1) = 15.88$, $p < .001$). This finding suggests that protective factors may be even more important for buffering the effect of risk factors among AI/AN youth, although the finding should be considered preliminary.

DISCUSSION

This study set out to fill several gaps in the literature on the roles of risk and protective factors in predicting suicide attempts in AI/AN youth. The first contribution was to utilize a population-based (statewide) youth sample to identify a group of AI/AN youth who live outside of tribal and BIA school settings. This study found that, consistent with prior work, AI/AN youth on average had more risk factors, and were more likely to attempt suicide, than other youth.

The second contribution was to provide information that could be directly translated into practice by adults who work with youth. Information about the risk and protective factors most strongly related to suicide attempts, as well as to other negative outcomes, is crucial so that staff know the indicators and know when to intervene to ensure youth receive specialized support services. This study found several important predictors of suicide attempts—even for the low-risk youth—such as having poor emotional health and experiencing harassment, which can again serve as a warning sign for direct service workers. Additionally, while many interventions focus on reducing (or treating) risk factors, work conducted by Borowsky et al. (1999) suggests that increasing protective factors may be even more feasible and, therefore, have the potential for greater impact.[8] The current study supports the idea that interventions focused on increasing protective factors could potentially prevent suicide by showing that protective factors contribute *independently* to fewer self-reported suicide attempts and can help reduce the effect of cumulative risk.

The third contribution was to compare the relationships between risk factors, protective factors, and suicide attempts for AI/AN and non-AI/AN youth. This study found that AI/AN and non-AI/AN youth had similar, but not identical, patterns of risk and protective factors predicting suicide attempts, and that the cumulative risk threshold for predicting suicide attempts was higher for AI/AN youth. This study also found a buffering effect of protective factors on the impact of risk factors; this effect was strongest for higher-risk youth. Because AI/AN youth were, on average, at higher risk than other youth, they tended to experience this greater buffering effect, though the interaction did not differ by race.

The Cumulative Risk/Protective Model for Suicide Attempts

The cumulative risk/protective models tested here offer important and useful information about risk and protective factors, how they interact, and the potential impact of accumulating risks or protective factors. Consequently, this study provides valuable information about how to identify youth at greatest risk of suicide attempts. For both AI/AN and non-AI/AN youth, the two risk factors most strongly related to suicide attempts were indicators of emotional and mental health, which clearly reinforces the results of other studies. Though there were many other risk and protective factors related to suicide attempts, their individual contributions were fairly small. When looking at risk and protective factors cumulatively (that is, how many risks does it take to put someone in the dangerous range?), for every additional risk factor, a youth is 1.4 times more likely to attempt suicide, and each additional protective factor decreases the likelihood of a suicide attempt by 50%. This finding sets a foundation for helping practitioners conduct appropriate suicide risk assessment. Service providers who gather information from youth about the risk and protective factors listed in Tables 1 and 2 and intervene with any youth who reports nine or more of the risk factors (or who is missing more than one of the protective factors) will identify the majority of youth at risk for suicide attempts.

In addition to being important across racial groups, emotional/mental health factors were important indicators for both high- and low-risk groups of youth. It is also noteworthy that the group of youth who appeared to be at high risk by the cumulative risk model (that is, they had 10 or more risk factors) but who did *not* report attempting suicide also tended not to have these most strongly predictive risk factors of depression or poor emotional health.

The cumulative risk and protection model also has some limitations in terms of its precision in predicting suicide attempts. The model "missed" about 2% of the youth who reported a suicide attempt, because they appeared to be at low risk. The low-risk group members who attempted suicide had several factors in common. First, despite having protective factors, they also reported symptoms of depression/anxiety and/or less-than-optimal emotional health. Almost 3 in 5 reported being the victim of recent harassment. These patterns indicate how crucial it is for adults to take seriously messages that youth share about their experiences, and to provide quick intervention and safety planning in order to prevent suicidal behaviors (Shain & the Committee on Adolescence, 2007; U.S. Public Health Service, 1999). Clearly, youth who are generally doing well (for example, achieving good grades and having supportive adults in their lives) can become hopeless, particularly as a result of victimization (Kim & Leventhal, 2008).

The differences found between AI/AN and non-AI/AN youth indicate the importance of training staff to work effectively with Native youth, their families, and their communities. The positive effect of protective factors on reducing AI/AN youth suicide attempts also suggests that the development of additional protective factors in youth that lack them might also buffer the detrimental effects of risk factors. It is possible that there are additional connections to cultural supports not measured by this study, such as hearing stories told by elders and other adult mentors, learning their Native language, or participating in traditional crafts and activities, that may have a positive buffering effect for Native youth.

Interaction of Risk and Protective Factors for Suicide Attempts

There were no significant interactions between risk and/or protection and race, gender, or age. Protective factors were independently related to suicide attempts and buffered against the effects of risk factors. This result confirms the earlier findings of Borowsky et al. (1999), who found the same result among AI/AN youth attending reservation-based schools, and extends those findings to a population-based sample of AI/AN youth. It may be that measuring additional protective factors, particularly cultural connections, would illustrate an even stronger buffering effect. The finding that protective factors have a unique contribution to understanding the potential for suicide attempts provides practitioners with guidance regarding the information they need to accurately assess suicide risk. It is important to gather information about risk factors; however, some youth and families will be hesitant to share sensitive information, particularly if the practitioner has not yet developed a relationship with the family. In some cases, it may be less threatening to ask about protective factors (e.g., whether the youth eats breakfast or makes decisions with the family), and in this study, missing just one protective factor put youth, particularly those who were also at high risk, at higher risk of suicide attempts. Asking about positive characteristics has the added potential benefit of building rapport and trust between the practitioner and family so that they may be more likely to share information about their challenges.

Risk Thresholds for Suicide Attempts

After confirming the applicability of the cumulative risk model to suicide attempts, and the importance of both risk and protective factors, the next logical step was to determine the point at which enough risks had accumulated to predict a suicide attempt: How many risks are too many? This level, or threshold, seemed important information to provide to practitioners, to help them identify who needs intervention and how to utilize limited resources. Threshold information offers a basis for interpreting information gathered through assessment and provides guidance for triage decisions when treatment and intervention resources for youth are limited.

In this study, AI/AN youth had, on average, two more risk factors than non-AI/AN youth, and their threshold was two risk factors higher than that of non-AI/AN youth (11 vs. 9). These findings may indicate that, though AI/AN youth have additional risk factors, on average, they have also developed coping mechanisms to deal with the increased risk. Additionally, it could be that they have additional protective factors that have not been measured in this study, possibly due to the resiliency of their cultural heritage (e.g., Hallet et al., 2007; Hill, 2009).

This study confirmed prior research with the findings that AI/AN youth were more likely to attempt suicide. However, this study also found that race did *not* have an *independent* relationship with suicide attempts after taking risk level into account. Although AI/AN youth are, on average, at higher risk than other youth, and, therefore, also appear as a group to be more likely to attempt suicide, this study suggests that any youth, regardless of race, facing multiple risk factors for suicide would react similarly. Additionally, while AI/AN youth are, on average, at higher risk than non-AI/AN youth, they also have a higher threshold for attempts (that is, they accumulate more risks than other youth before attempting).

The risk threshold was a better predictor of true positives (finding those youth who did report a suicide attempt) than was the protective threshold. It is possible that, because the cumulative protection model was more limited (due to smaller numbers of protective factors and, potentially, an attenuated range of possible scores), observing additional protective factors in the future might yield a stronger result. The risk threshold was also better at predicting true positives among AI/AN youth than non-AI/AN youth. This finding is important because risk factors often are the issues that are noticed first. It is important that adults who spend time with youth understand the thresholds and take an accumulation of risk factors very seriously.

The risk threshold model produced by this study was able to identify approximately three quarters of the youth who reported a suicide attempt. While this model alone would still miss some youth, it provides a relatively simple way to protect a large proportion of the youth at risk. Ensuring staff have the information about key risk and protective factors and how important cumulative risks are has the potential for identifying many youth before they put themselves in danger.

Limitations of the Study

This study utilized publicly available data, which provided a large amount of information about a very large sample of youth. However, this use of archival data limited the study because it constrained the content that was available. There were very few available protective factors in this survey, yet even the five that were included in this model demonstrated a buffering effect on risk for suicide attempts. Future studies would benefit from an explicit focus on additional protective factors. In addition, this survey did not include any culturally specific questions.

The use of archival data also meant that this study was constrained by the survey's methodology. The authors did not have direct access to youth to develop rapport, probe, or ask clarifying questions, nor could they control the environment in which students completed the survey to ensure youth felt comfortable and that their confidentiality would be protected. The anonymous nature of the survey likely increased the honesty of youth responses; however, because the survey was conducted in schools, some students may have feared that their responses would be linked to them. Some of the analyses in this study indicated the likelihood that some youth underreported risk factors. It is possible that youth in the low-risk/attempter group decided not to report some risk factors or overstated some of their protective factors.

This study also is limited in that it included only youth who answered all possible items on the survey related to the risk and protective factors of interest, as well as the suicide attempt outcome. This decision was made to allow modeling of the relationships between these variables. Youth who *did not* complete all of the risk and protective factor questions (and, therefore, were not included in the study) had higher rates of attempts than the youth in this study sample. Future work could be done to investigate which variables had more missing data and the potential impact of dropping these youth from the study for the purposes of modeling the relationship between these variables of interest. Because only 43% of all surveys contained complete information, the resulting study sample was lower risk than the overall population, and the true rates of suicide attempts among the sample were likely underreported. As well, the results from this study err on the conservative side because the youth surveyed were those attending school; thus the population did not include youth who had dropped out of school or who were absent (ill or truant).

Finally, this study relied on cross-sectional data. Cross-sectional data do not provide as powerful a link to causality as would be present if the study had used two data points in time. While the survey data used here are collected annually, the individual forms are anonymous, so youth responses cannot be linked across multiple time points.

It is hoped that, despite these limitations, the contributions of this study will be useful to practitioners, especially non-clinical staff working with youth, to appropriately and quickly identify youth at risk for suicide attempts, intervene to improve the mental health status of youth and build protective factors, and ultimately prevent youth suicide.

Next Steps

The results of this study point to several areas that could be developed to benefit youth and the staff who serve them.

1. **Know the risk factors** for suicide attempts (Table 1 in this article).

2. **Know when to intervene** (youth with nine or more risk factors, youth who are missing one of the five protective factors, or any youth [even at low risk] with the key risk factors of poor emotional health or experiences of harassment).
3. **Work to increase protective factors**. A focus on positives can help engage youth and families who may be hesitant to engage in treatment services.
4. **Be creative about identifying and strengthening cultural protective factors** and other strengths not included in this study that could reduce the risk for suicide attempts as well as be a buffer for other risk factors.
5. **Remember. The power of protection benefits all of us, including our youth.**[9]

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FOOTNOTES

[1] Although these are sobering statistics, it is important to point out that there are wide variations in suicidality among different AI/AN communities, ranging from rates well below the U.S. average to well above (Novins, Beals, Roberts, & Manson, 1999; Hallet, Chandler, & Lalonde, 2007).

[2] It is important to note that in many smaller AI/AN communities, behavioral health care is not readily available. Therefore, it is imperative to ensure that all staff working with youth (teachers, those in prevention or recreation programs, etc.) are trained to assess risk and be informed about resources.

[3] This observation was kindly made by an anonymous reviewer of an earlier version of this paper. The 2010 U.S. Census (2012) found that 21% of AI/AN peoples (alone or multiracial) lived on reservations and/or off-reservation trust lands (Federal), tribal or tribally designated statistical areas, and state-designated American Indian statistical areas, while 78% were dispersed throughout the general population.

[4] For more information about the OHT Survey methodology, please see Oregon Department of Human Services, 2006.

[5] To be consistent with the notion of a risk and protective factor checklist, the 19 indicators measured on an interval scale were dichotomized (yes/no) based on cut points identified by examining contingency tables (indicator X suicide attempt) with standardized residuals. For risk factors, the cut point was the response scale value at which standardized residuals were positive, suggesting that responses greater than or equal to the cut point were associated with a greater likelihood of reporting a suicide attempt in the past year. For protective factors, the cut point was the response scale value at which standardized residuals were negative, suggesting that responses greater than or equal to the cut point were associated with a lower likelihood of reporting a suicide attempt in the past year.

[6] Sexual identity was included on the 11th grade survey only (n = 5,260) and, therefore, was not included in subsequent analyses.

[7] The gender effects related to risk and protective factors and suicide attempts will be described in a subsequent paper.

[8] Similarly, in a study on violence perpetration among AI/AN youth, Bearinger et al. (2005) found that protective factors greatly diminished violence perpetration.

[9] For those practitioners new to suicide prevention, we suggest the following list of action items:

1. **Train staff** who work with youth to **recognize the signs and symptoms of suicide** attempts, to build 1) a common awareness of this serious issue, 2) an understanding of how important risk and protective factors are, and 3) a common language for sharing information with each other.
2. **Train youth to recognize the signs and symptoms of suicide** attempts, to build 1) a common awareness of this serious issue, 2) an understanding of how important risk and protective factors are, and 3) a common language for sharing information with each other. Youth are more likely to reach out to other youth. Training youth creates a broader base of positive peers who can act as peer-, school- and community-level protective factors for other youth.
3. **Make sure staff feel comfortable addressing suicide with youth and that they are prepared to step in when needed.** Provide staff, and other adults who are in contact with youth, training and practice in what to say and the steps to take if they become concerned about a youth. Existing training packages, ranging in intensity, can be accessed in many communities. Examples include Question/Persuade/Refer (QPR) for general introductory information about preventing suicide, and Applied Suicide Intervention Skills Training (ASIST) for practicing intervention skills.
4. **Make sure that youth who exhibit the strongest risk factors are getting intervention and support.** If they aren't, be creative about how to make those linkages.
5. **Pay attention to protective factors.** Map out strengths in the youth's life in the areas of community (Does the youth have supportive elders? Does s/he have many opportunities to engage in cultural or other healthy activities?); school (Is there a supportive adult at school?); family (Is there a supportive adult at home? Does the youth get recognized at home for positive behaviors?); peer (Does the youth have friends who are a positive influence?) and individual (Does the youth have hopes for the future, hobbies or interests to sustain her/him?). If a youth is missing one or more protective factors, work on ways to fill the gap. Discuss with colleagues the ways that staff can help develop protections and connect youth to available community resources to increase their support networks.
6. **Reach out to parents** to ensure they have the support and information they need to help their children successfully grow into healthy adults. Make sure that parents and guardians understand their important roles and responsibilities even (perhaps especially) for their adolescent children, and how to build protective factors and be aware of risk factors.
7. **Use all the excellent resources that are available.** For example, the Suicide Prevention Resource Center at SPRC.org has a host of information about suicide prevention: strategies, fact sheets, research, etc.

Appendix A
Items from Oregon Healthy Teens Survey

1. During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?
2. Beck Depression Inventory (α = .84)

   During the past 30 days, how much of the time have you:
   1. Been a very nervous person?
   2. Felt calm and peaceful?
   3. Felt downhearted and blue?
   4. Been a happy person?
   5. Felt so down in the dumps that nothing could cheer you up?
3. Would you say that in general your emotional and mental health is...
   1. Poor.
   2. Fair.
   3. Good.
   4. Very good.
   5. Excellent.
4. During the past 12 months, did you have any emotional or mental health care needs that were not met?
5. Has a doctor, nurse, or other professional ever told you that you have an emotional condition such as depression or anxiety?
6. During the past 30 days, on how many days did you smoke cigarettes?
7. On how many occasions (if any) have you had beer or wine (non-religious) or hard liquor to drink during the past 30 days?
8. During the past 30 days, how many times did you use marijuana?
9. During the past 30 days, how many times did you sniff glue, breathe the contents of aerosol spray cans, or inhale any paints or sprays to get high?
10. During the past 30 days, how many times did you use prescription drugs (without a doctor's orders) to get high?
11. Incidence of alcohol-related problems in last 12 months

    In the last 12 months, how often have you:
    1. Missed school or class because of drinking alcohol?
    2. Gotten sick to your stomach because of drinking alcohol?
    3. Not been able to remember what happened while you were drinking alcohol?
    4. Later regretted something you did while drinking alcohol?
    5. Worried that you drank alcohol too much or too often?

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Appendix A, Continued
Items from Oregon Healthy Teens Survey

12. Driving or being driven by someone who had been drinking alcohol in past 30 days
    1. During the past 30 days, how many times did you drive a car or other vehicle when you had been drinking alcohol?
    2. During the past 30 days, how many times did you ride in a car or other vehicle driven by a teenager who had been drinking alcohol?
    3. During the past 30 days, how many times did you ride in a car or other vehicle driven by a parent or other adult who had been drinking alcohol?
13. During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?
14. During the past 12 months, how many times have you attacked someone with the idea of seriously hurting them?
15. During the past 12 months, did your boyfriend or girlfriend ever hit, slap, or physically hurt you on purpose?
16. During your life, has any adult ever intentionally hit or physically hurt you?
17. During the past 30 days, have you ever been harassed at school (or on the way to or from school) in relation to any of the following issues?
    1. Race or ethnic origin
    2. Unwanted sexual comments or attention
    3. Someone thought you were gay, lesbian, or bisexual
    4. Your weight, clothes, acne, or other physical characteristics
    5. Your group of friends
    6. Other reasons
18. Have you ever been physically forced to have sexual intercourse when you did not want to?
19. During your life, has any adult ever had sexual contact with you?
20. Have you ever given in to sexual activity when you didn't want to because of pressure?
21. Extent to which parents approve of substance use ($\alpha = .75$)
    1. How wrong do your parents feel it would be for you to smoke cigarettes?
    2. How wrong do your parents feel it would be for you to drink beer, wine, or hard liquor (for example, vodka, whiskey, or gin)?
    3. How wrong do your parents feel it would be for you to smoke marijuana?
22. Easy to get substances ($\alpha = .77$)

    In the past 12 months, how many of your 4 best friends have:
    1. Tried beer, wine, or hard liquor (for example, vodka, whiskey, or gin)?
    2. Used marijuana?
    3. Used LSD, cocaine, amphetamines, or other illegal drugs?
    4. Carried a handgun?
    5. Been members of a gang?

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Appendix A, Continued
Items from Oregon Healthy Teens Survey

6. Dropped out of school?
7. Been suspended from school?
8. Sold illegal drugs?
9. Stolen or tried to steal a motor vehicle such as a car or motorcycle?
10. Been arrested?

24. Extent of crime & feeling unsafe in neighborhood (α = .78)
    1. There is a lot of crime and/or drug selling.
    2. There are many physical fights.
    3. I'd like to get out of my neighborhood.
    4. I like my neighborhood.
    5. I feel safe in my neighborhood.
    6. If I had to move, I would miss the neighborhood I now live in.
25. During the past 7 days, on how many days did you eat breakfast?
26. Would you say that in general your physical health is...
    1. Poor.
    2. Fair.
    3. Good.
    4. Very good.
    5. Excellent.
27. I can work out my problems.
28. I help make decisions with my family.
29. Putting them all together, what were your grades like last year?

Appendix B
Details on Scale Creation

Beck Depression Inventory. Participants reported how frequently (on a scale from 1 = *none of the time* to 6 = *all of the time*) they experienced different emotions in the past 30 days (e.g., happy, downhearted and blue) using five items from Beck Depression Inventory (Beck & Steer, 1984). The five items were averaged (positively worded items, e.g., feeling happy or calm, were reverse-coded) so that high scores indicated more frequently experiencing depressive symptoms (Cronbach's α = .84). Scale scores were dichotomized (0/1) using 2.6 as a cut point, which approximately refers to 0 = "none or a little bit of the time" and 1 = "some of the time or more often."

Alcohol-related problems. Participants reported whether or not they had experienced five different problems associated with drinking alcohol in the past 12 months (e.g., missed school, got sick to your stomach, regretted something you did when drinking). Responses to each item (ranging from 1 = *0 times* to 5 = *10 or more times*) were dichotomized (0 = 0 times and 1 = 1 or more times) and summed to create

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Appendix B, Continued
Details on Scale Creation

a count of the alcohol-related problems experienced in the past 12 months. Scores could range from 0 to 5. Scale scores were dichotomized (0/1) using 1 as a cut point, such that 0 = "no problems" and 1 = "at least 1 problem at least 1 time."

Drove in car when someone was drinking. Participants reported on how many times they had been in a motor vehicle when someone (themselves, another teen, or an adult) had been drinking alcohol in the past 30 days. Responses, which ranged from 1 (*0 times*) to 5 (*6 or more times*), were dichotomized so that 0 = 0 times and 1 = 1 or more times. All three variables were summed to create a count ranging from 0 to 3. Scale scores were dichotomized (0/1) using 1 as a cut point, with 0 = "0 times" and 1 = "at least 1 time with at least 1 person."

Harassment at school. Participants reported on whether or not they experienced harassment at school for six different reasons (e.g., weight, clothes, acne, or other physical characteristics; group of friends; other) in the past 30 days. If participants answered each harassment question as "no," they were coded as 0 = "not harassed." If participants indicated that they were harassed for at least one reason, they were coded as 1 = "harassed."

Parents approve of substance use. Participants reported on the extent to which their parents think it is wrong for their son/daughter to smoke, use alcohol, and use marijuana on a scale from 1 (*not wrong at all*) to 4 (*very wrong*). The three items were averaged and subtracted from 5 to create a scale in which higher scores indicated *more approval* for substance use (Cronbach's $\alpha = .75$). The scale scores were dichotomized (0/1) using 1.3 as a cut point, which is approximately 0 = "very wrong" and 1 = "somewhat or not at all wrong."

Substances easy to get. Three items assessed how easy participants thought it would be to get alcohol, marijuana, and other drugs (e.g., cocaine, LSD) if they wanted them using a scale from 1 (*very easy*) to 4 (*very hard*). All items were reverse coded and averaged so that higher scores indicated that substances were easier to get (Cronbach's $\alpha = .77$). The scale scores were dichotomized (0/1) using a cut point of 2.4, which approximately means that substances are either 0 = "hard" or 1 = "easy" to get.

Extent of four best friends involved in problem behavior. Participants responded to 10 items asking how many of their four best friends were involved in various types of problem behaviors in the past 12 months (e.g., alcohol use, gangs, weapons, school suspensions) using a scale that ranged from 1 (*0 friends*) to 5 (*all 4 friends*). All of the items were averaged to create an index of friend involvement in problem behavior, with higher scores indicating more friends involved in more problem behaviors. Scale scores were dichotomized (0/1) using 1.4 as the cut point, such that 0 = "no or minimal friend involvement in problem behaviors" and 1 = "multiple friends involved in multiple problem behaviors."

Extent of crime and safety in neighborhood. Six items assessed the extent of crime and safety in participants' neighborhoods (e.g., crime, physical fights, feeling safe) using a scale from 1 (*not at all true*) to 4 (*very much true*). Three positively worded items (e.g., "I feel safe in my neighborhood") were reverse-coded and all six items were averaged so that higher scores indicated more perceived crime and less safety in the neighborhood (Cronbach's $\alpha = .78$). Scale scores were dichotomized (0/1) using a cut point of 2.2, which approximately means that 0 = "not at all true" and 1 = "at least a little true."