LATENT CLASS ANALYSIS OF SUBSTANCE USE AND AGGRESSIVE BEHAVIOR IN RESERVATION-BASED AMERICAN INDIAN YOUTH WHO ATTEMPTED SUICIDE

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Abstract: American Indian (AI) adolescents who attempt suicide are heterogeneous. A latent class analysis was used to identify subgroups of reservation-based AI adolescents with recent suicide attempts. Indicators of class membership were substance abuse and aggressive behaviors; clinical correlates of subgroup membership included risky sexual behavior and recent exposure to suicidal behavior. Three subgroups were identified, representing low, medium, and high substance use and aggressive behavior. Suicide exposure was associated with membership in the lowest risk behavior subgroup; risky sexual behavior was associated with membership the highest risk behavior subgroup. Findings suggest a continuum of risk behaviors in reservation-based AI youth who attempt suicide.

Suicide among reservation-based American Indian (AI) youth is a significant public health concern and impacts entire communities. Deaths by suicide peak in AI adolescents and young adults, rather than among older adults as seen in non-AI populations (Mullany et al., 2009; Wexler, Silveira, & Bertone-Johnson, 2012). Suicide rates among AI adolescents on the reservation in the current study are 128.5 per 100,000, 13 times higher than general U.S. adolescent rates (Mullany et al., 2009). Many reservation-based AI youth will have one, if not multiple, members of their social network who have attempted or died by suicide (Wissow, Walkup, Barlow, Reid, & Kane, 2001). While adolescent suicide has a devastating impact on AI reservations, these communities also have unique assets for suicide prevention embedded in traditional culture, language, involvement of elders with youth, and tribal sovereignty that can yield innovative community-based interventions (Barlow & Walkup, 2008; Henry, Allen, Fok, Rasmus, & Charles, 2012; Wallerstein & Duran, 2006). Therefore, approaches to youth suicide prevention on reservations should be as multi-faceted as the communities themselves (Wexler & Gone, 2012).

A critical issue for building a comprehensive suicide prevention program is the heterogeneity of at-risk individuals (Novins, Beals, Roberts, & Manson, 1999). A host of factors may lead an adolescent to consider suicide, each with specific implications for treatment and future prevention efforts. The current body of research among AIs is limited in that it relies largely on analyses that do not take into account the continuum of risk behaviors, such as substance use, aggression, depression, and previous suicide attempt that relate to suicide risk. One potential method of identifying subgroups for targeted prevention is Latent Class Analysis (LCA), a person-centered analysis that identifies classes of individuals based on their responses to a series of indicators. LCAs have been conducted with adolescents who have attempted suicide using national (Pena, Matthieu, Zayas, Masyn, & Caine, 2012) and state data (Jiang, Perry, & Hesser, 2010), as well as among specific ethnic groups (Wong & Maffini, 2011). These studies have used indicators such as substance abuse, aggression, and depression, but none has focused specifically on AI adolescents.

Understanding potential subgroups among AI adolescents who attempt suicide is an essential step toward AI suicide prevention. Depending on the profile of risk, interventions could focus on individual, family, and/or community-level factors (Wexler & Gone, 2012). In past studies, substance use (including alcohol and drug use) and aggressive behavior were correlated with increased suicidal ideation and attempts in samples of AI, Alaska Native, and First Nations adolescents (Mota et al., 2012; Shaughnessy, Doshi, & Jones, 2004; Yoder, Whitbeck, Hoyt, & LaFromboise, 2006). According to the National Violent Death Reporting System, blood alcohol content is higher among AIs at the time of suicide death than among other ethnic groups (Caetano et al., 2013). Over half of one sample of reservation-based AI adolescents was intoxicated at the time of suicide attempt or death (Barlow et al., 2012). Aggressive behavior, including being in a physical fight, has been associated with lifetime suicide attempt in analyses of responses from the Youth Risk Behavior Survey in AI high school students (Shaughnessy et al., 2004). Substance use and aggression have been shown to cluster in LCA of a nationally representative sample of high school-age suicide attempters that excluded AI students due to sample size (Pena et al., 2012). In this sample, physical fights, binge drinking (five or more alcoholic drinks on one occasion), and marijuana and other substance use co-occurred across three latent classes, which were designated "low," "high," or "extreme" depending on their level of risk behavior (Pena et al., 2012).

Other risk factors may have a differential impact on suicidal behaviors among AI adolescents. Depression is a well-established suicide risk factor among general U.S. adolescent samples (Nock et al., 2013; Portzky, Audenaert, & van Heeringen, 2005), but has shown a weaker relationship with AI adolescent suicide (Novins et al., 1999; Yoder et al., 2006). Risky sexual behavior, including sex without a condom, has been associated with suicide attempt (Epstein & Spirito, 2009; Shaughnessy et al., 2004); the fact that 46% of AI females bear children in adolescence, compared to 25% for

U.S. All Races (Indian Health Service, 2001), suggests that AI adolescent females are a high-risk subgroup. Lastly, high exposure to suicidal behavior by friends or family in some reservation communities has been associated with increased rates of lifetime suicide attempt, as well as with suicide clusters (Burke et al., 2010; Wissow et al., 2001). Understanding subgroups of suicidal individuals based on indicators of substance use and aggressive behavior allows us to identify those individuals at risk for subsequent suicidal behaviors and to develop tailored interventions. Additionally, with the identification of these subgroups, we can explore subgroup differences in predictors and outcomes of class membership.

The primary aim of this project was to identify subgroups of individuals from a sample of AI adolescents who attempted suicide through LCA of substance use and aggressive behavior. In this paper, we evaluate the impact of age, gender, and suicide exposure on class membership, as well as the association between class membership and history of multiple attempts, depression, and risky sexual behavior. Age and gender were included due to the relationship of these variables to suicide attempts (Brent, Baugher, Bridge, Chen, & Chiappetta, 1999), and multiple attempts was included as an outcome due to its relationship to later suicide death (Suominen et al., 2004). It was hypothesized that substance use and aggressive behavior would co-occur, as seen in other national analyses. We also hypothesized that depression, risky sexual behavior, and exposure to suicide would be associated with class membership.

METHODS

Population and Participants

The study population is the White Mountain Apache Tribe of approximately 17,100 enrolled members. Study participants were AI adolescents ages 13-18 years who made a recent suicide attempt (past 90 days) and resided on the White Mountain Apache Reservation in Northeastern Arizona.

Recruitment and Data Collection

Participants were identified and recruited between November 2006-June 2011 via the Apache Surveillance System and were enrolled into one of two studies: a descriptive exploration of risk and protective factors or a pilot of a brief, emergency department-linked intervention (Cwik et al., in press; Cwik, 2015). The Apache Surveillance System, described in detail elsewhere (Barlow et al., 2012; Cwik et al., 2014; Mullany et al., 2009), is a tribal-initiated system in which all members of the community are mandatory reporters of suicidal ideation, attempt, and death. After a report is made to the surveillance system, in-person follow-up is initiated to confirm the events, gather details, and facilitate connections to care (Cwik et al., 2014).

Parents/legal guardians for participants under the age of 18 years and participants age 18 years gave informed consent, and participants age 17 years and under gave assent. Apache study staff collected data via self-report surveys (described below), either in the participant's home or the study office, over 1-2 visits (approximately 2-4 hours). Participants received gift cards for completion of study measures.

Human Subjects Review

Both studies were reviewed and approved by the Johns Hopkins and Phoenix Area Indian Health Service Institutional Review Boards, and the White Mountain Apache Health Advisory Board and Tribal Council. This manuscript represents a secondary data analysis of these studies, and was reviewed and approved by the White Mountain Apache Health Advisory Board and Tribal Council.

Measures

The Youth Risk Behavior Survey (YRBS) is self-report measure administered nationally in high schools by the Centers for Disease Control and Prevention to assess a variety of high-risk behaviors. YRBS items have shown good reliability (Brener et al., 2002) and validity (May & Klonsky, 2011) and have been used with several AI samples (Borowsky, Resnick, Ireland, & Blum, 1999; Pavkov, Travis, Fox, King, & Cross, 2010). The 2005 version was used to assess indicator variables in the LCA—1) physical fights, 2) binge drinking, and 3) marijuana use—using individual items from the YRBS and original response categories (i.e., non-collapsed); 4) substance use was assessed by collapsing the lifetime use of cocaine, heroin, inhalant, and methamphetamine variables (see Table 1 for response categories). For substance use, the highest frequency of use for any of the four substances was coded (Pena et al., 2012). Items from the YRBS assessing multiple suicide attempts and sexual behavior were included to test possible associations with class membership. These variables were collapsed due to power concerns. Multiple suicide attempts in the past year were dichotomized into "one attempt" or "two or more suicide attempts." Sexual behavior was categorized as either "no sexual intercourse," "sexual intercourse with a condom," or "sexual intercourse without a condom."

The Center for Epidemiologic Studies Depression Scale (CES-D) is a widely used self-report measure of depressive symptoms (Radloff, 1977) and has been used with AI samples (Somervell et al., 1992). Standard scoring procedures were used to categorize depressive symptoms into low, medium, and high subgroups.

Table 1
Physical Fights, Alcohol Use, and Marijuana and Other Substance Use in Study Sample

		n	Percent
	0 times (*Fight1*)	22	24
	1 time (*Fight2*)	21	23
	2 or 3 times (*Fight3*)	28	30
Physical fight in last 12 months	4 or 5 times (*Fight4*)	8	9
	6 or 7 times (*Fight5*)	2	2
	8 or 9 times (*Fight6*)	3	3
	10 or 11 times (*Fight7*)	4	4
	12 or more times (*Fight 8*)	5	5
	0 days (*Alc1*)	40	43
	1 day (*Alc2*)	19	20
Drank 5+ alcohol drinks at one time in last 30 days	2 days (*Alc3*)	11	12
	3 to 5 days (*Alc4*)	15	16
	6 to 9 days (*Alc5*)	5	5
	10 to 19 days (*Alc6*)	2	2
	20+ days (*Alc7*)	0	0
	0 times (*Mj1*)	15	16
	1 or 2 times (*Mj2*)	15	16
	3 to 9 times (*Mj3*)	12	13
Marijuana, lifetime	10 to 19 times (*Mj4*)	10	11
	20 to 39 times (*Mj5*)	9	10
	40 to 99 times (*Mj6*)	16	17
	100+ times (*Mj7*)	16	17
	0 times (*Subst1*)	53	57
Other substances (heroin, cocaine, methamphetamine, inhalants), lifetime	1 or 2 times (*Subst2*)	16	17
	3 to 9 times (*Subst3*)	13	14
	10 to 19 times (*Subst4*)	5	5
	20 to 39 times (*Subst5*)	2	2
	40+ times (*Subst6*)	4	4

The Voices of Indian Teens-Happenings Scale (VOIT) is a self-report measure of stressful events related to family, school, relationships, major life changes, and illness (Manson, 1991). Items assessing the suicide attempt of a family member or friend in the last 6 months were dichotomized into "yes" or "no" responses.

Data Analysis

LCA was performed with the four YRBS items as indicators measuring aggressive behavior and substance use as indicators of class membership using Mplus v.7.1 software (Muthén & Muthén, 1998-2013). We did not collapse the variables in order to replicate findings from Pena et al. (2012) in a reservation-based AI sample and to obtain a more fine-grained detail about the behavior. Analysis began with class enumeration, whereby models were fit with an increasing number of classes, without the inclusion of covariates (Nylund, Asparouhov, & Muthén, 2007). Bayesian information criterion (BIC), Lo-Mendell-Rubin Likelihood Ratio Test (LMR LTR; Nylund et al., 2007), Bootstrapped Likelihood Ratio Test (BLRT), and entropy are standard structural equation modeling fit statistics that were used to compare model fit during class enumeration. As stated by Nylund et al. (2007), the BLRT represents a "very consistent" indicator of number of classes when compared to other approaches. In addition to these traditional fit statistics, we also explored how each set of classes fit within our substantive theory that there would be subgroups of reservation-based AI adolescents who have attempted suicide in order to inform the number of classes. Once the number of classes was chosen using these fit statistics, predictors of class membership (i.e., age, gender, suicide exposure) and outcomes (i.e., multiple attempts, depression, sexual behavior) were added to the model. All of the predictors (age, gender and suicide exposure) were included in the membership model as covariates, so that the fit statistics assessed the model as a whole. The final model was run in Mplus using these predictors and outcomes. Predictors of class membership were evaluated using logistic regression; outcomes were evaluated using chi-square analyses. Because of the small sample size, we were reluctant to run additional analyses of potential outcomes using continuous (i.e. non-dichotomous) variables. Other variables were not included in the model if the data were incomplete (e.g., method of attempt, $n = 81$), as we did not want to reduce the sample size. Missing data were handled in Mplus using full information maximum likelihood estimation (Muthén & Muthén, 1998-2013), which adjusts the parameter estimates from all available information (Muthén & Shedden, 1999; Schafer & Graham, 2002). For these models to converge successfully, Mplus requires the proportion of data available for each study variable and between each pair to be at least 0.10 (Muthén & Muthén, 1998-2013). Coverage for all variables and comparisons was approximately 0.989 in the current study.

RESULTS

Sample Characteristics

A total of 93 participants were included in the analyses. 67% ($n = 62$) were female and the average age was 15.6 years ($SD = 1.9$). Of the participants with data on suicide attempt method ($n = 81$), 32% ($n = 26$) attempted suicide by alcohol/drug overdose, 30% ($n = 24$) by hanging/asphyxiation, 28% (n = 23) by laceration, and 10% ($n = 8$) by jumping. Twenty percent ($n = 19$) reported that a family member and 39% ($n = 36$) that a friend had attempted suicide in the past 6 months. The majority (68%, $n = 64$) met criteria for moderate to severe depression and a substantial proportion (38%, $n = 35$) reported two or more suicide attempts. Twenty-three percent ($n = 21$) indicated they had had sex without a condom at their last sexual encounter.

Table 1 presents data on physical fights, binge drinking, and marijuana and other substance use in the study sample. The majority reported lifetime marijuana use (84%, $n = 78$), had been in a physical fight during the past 12 months (76%, $n = 71$), and had drunk five or more alcoholic drinks in the past 30 days (56%, $n = 53$). The majority of the sample had never used heroin, cocaine, methamphetamine, or inhalants in their lifetime (57%, $n = 53$).

Number and Description of Subtypes

Using the fit statistics from Table 2, a three-class model provided the best fit. The sample size adjusted BIC was at its lowest point (1239.25) for the three-class model, which indicated adequate fit with the most parsimonious model. Entropy was suitably high (.871, scores closer to 1 indicate better classification quality). A nonsignificant BLRT indicated that a four-class solution was not needed (Nylund et al., 2007).

Table 2
Model Fit Statistics for Sample Estimating 1 Through 4 Subgroups

Class	Log Likelihood	# of Free Parameters	SSA BIC[a]	LMR-LRT p Value	BLRT p Value	Entropy	Smallest Class
1-class	-624.625	23	1282.073	n/a	n/a	n/a	n/a
2-class	-587.343	47	1241.179	0.85	0	0.842	.33 (32)
3-class	-568.963	71	1239.251	0.911	0	0.871	.19 (19)
4-class	-552.912	95	1241.401	0.7662	0.25	0.918	.10 (9)

[a] SSA BIC is the sample size adjusted BIC value.

Regarding the three subgroups, 20% of participants ($n = 19$) were in the "high-risk behavior" subgroup, 58% ($n = 54$) were in the "moderate-risk behavior" subgroup, and 22% ($n = 20$) were in the "low-risk behavior" subgroup. Stacked bar graphs of the probability of endorsing items related to physical fights, binge drinking, and marijuana and other substance use by class are presented in Figures 1-4. Suicide attempters in the high-risk behavior class were characterized by comparatively high rates of all behaviors examined—physical fights, binge drinking, and marijuana and other substance use. Of note, marijuana use was particularly high in this class in comparison to other behaviors, as well as in relation to the other classes. For suicide attempters in the moderate-risk behavior class, binge drinking and marijuana use were their most frequent risk behaviors; other substance abuse propensity was low, but not quite as low as in the low-risk behavior class. The moderate-risk behavior class had less propensity for physical fights, comparable to the low-risk behavior class. Suicide attempters in the low-risk behavior class were characterized by low rates of behaviors across categories, including almost nonexistent use of other substances according to item response probabilities.

Figure 1
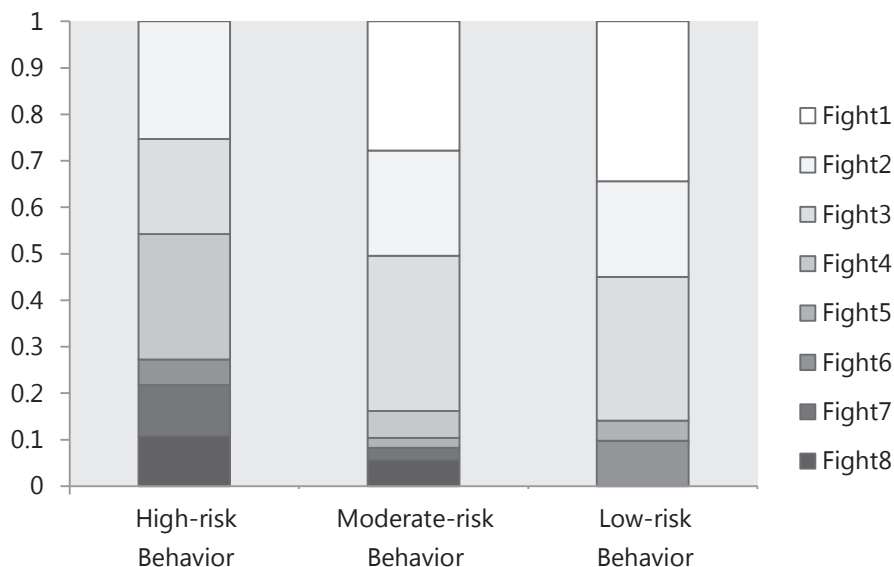**Item Response Probabilities for Physical Fight Frequency across Latent Classes**

Figure 2
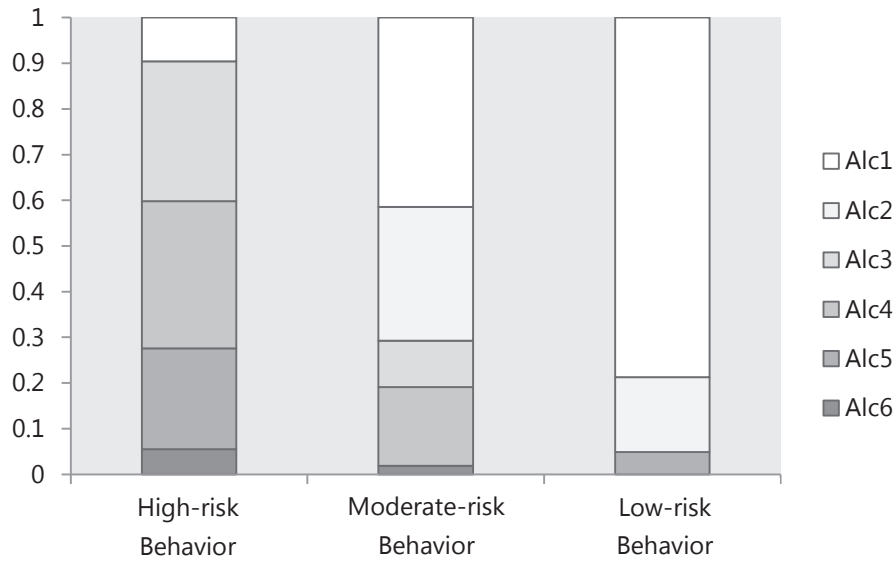**Item Response Probabilities for Binge Drinking Frequency across Latent Classes**

Figure 3
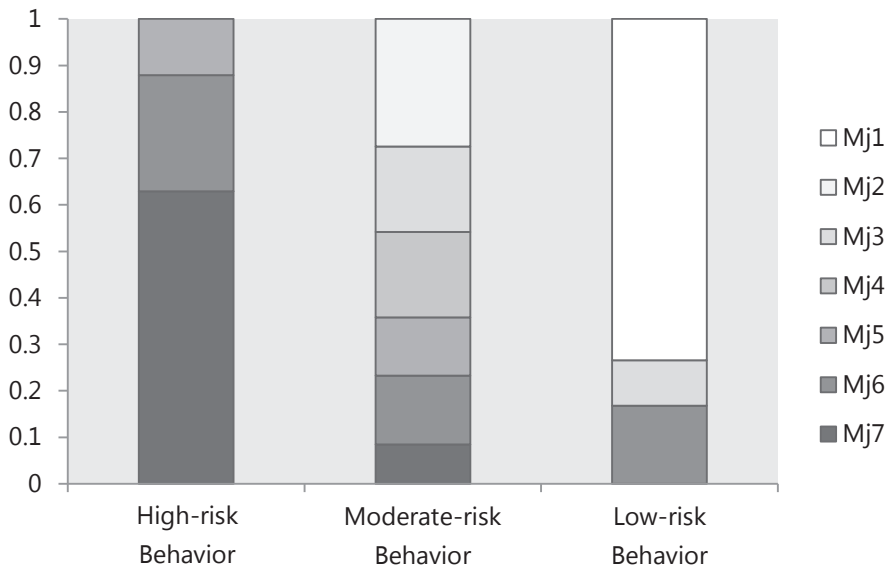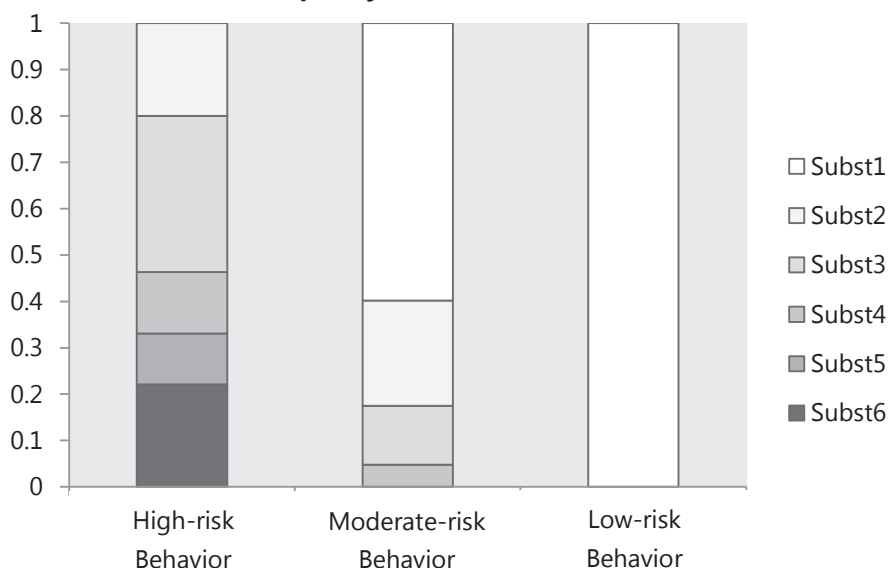**Item Response Probabilities for Binge Drinking Frequency across Latent Classes**

Figure 4
Item Response Probabilities for Other Substance (Cocaine, Heroin, Methamphetamine, Inhalants) Frequency across Latent Classes

Frequencies of predictor and outcome variables by class membership, obtained from the overall Mplus model, are presented in Table 3. For the predictor variables, age significantly predicted class membership, with older participants more likely to be in the high-risk behavior subgroup as compared to the low-risk behavior subgroup (OR = 2.16, $p < .05$). In addition, participants with a history of family suicide attempt were more likely to be classified in the low-risk behavior subgroup (OR = 9.81, $p < .05$). There were no differences in predicting class membership by gender (OR = 0.53, $p = .53$) or history of a friend's suicide attempt (OR = 0.78, $p = .72$) between the high- and low-risk subgroups.

Table 3
Frequency of Predictors and Outcomes by Class Membership

	Class Membership			
	High-risk Behavior	Moderate-risk Behavior	Low-risk Behavior	Total
	n (%)	*n* (%)	*n* (%)	*N* (%)
Predictors				
Gender				
Female	12 (63)	36 (67)	14 (70)	62 (67)
Age				
12-15 years	5 (36)	22 (41)	15 (75)[a]	42 (45)

Table 3, Continued
Frequency of Predictors and Outcomes by Class Membership

	Class Membership			
	High-risk Behavior	Moderate-risk Behavior	Low-risk Behavior	Total
	n (%)	*n* (%)	*n* (%)	*N* (%)
Predictors				
Exposure to suicide in last 6 months				
Family member attempted suicide	2 (11)	6 (11)	11 (55)[b]	19 (20)
Friend attempted suicide	8 (42)	19 (35)	9 (45)	36 (39)
Outcomes				
Multiple suicide attempts in last year				
2+ attempts	9 (47)	13 (24)	3 (15)	25 (27)
Depression				
Severe depression	5 (26)	19 (35)	8 (40)	32 (34)
Behavior during last sexual encounter				
Sexual intercourse without a condom	9 (47)[c]	8 (15)	4 (20)	21 (23)

[a] The low-risk behavior class was younger than the high-risk behavior class, *p* < .05.
[b] The low-risk behavior class was more likely to have a history of family suicide attempt than either the moderate- or high-risk behavior class, *p* < .05. [c] The high-risk behavior class was more likely to report sex without a condom than either the moderate- or high-risk behavior class, *p* < .05.

In the outcomes analysis, individuals in the high-risk behavior class were more likely to have sex without a condom then both individuals in the moderate- ($X^2 = 7.46$, $p < .05$) and low-risk behavior classes ($X^2 = 7.50$, $p < .05$). Multiple suicide attempts ($X^2 = 0.65$, $p = .72$) and depression ($X^2 = 0.17$, $p = .92$) were not associated with class membership.

DISCUSSION

LCA of reservation-based AI adolescents who attempted suicide identified three underlying subgroups differentiated by substance use and aggressive behavior: low, medium, and high risk, similar to results from national samples (Pena et al., 2012). However, a distinct profile of AI adolescents with a suicide attempt emerged. Rates of certain established suicide risk factors in other populations, including gender, repeated suicide attempts, and depressive symptoms, did not differ across classes within this AI sample, in contrast to factors such as suicide exposure and sexual behavior. While the low sample size may have limited the power to make these comparisons, these findings also may signify important cultural differences in AI suicide risk. Specifically, the presence of females in the high-risk behavior subgroup implies that high levels of substance use and aggression are not limited to males in this community, and interventions should be tailored

accordingly. The absence of significant differences across subgroups for depression and multiple attempts may imply that each subgroup is associated with comparable risk for future re-attempt, or that suicide risk severity may be associated with different factors in AI communities than in non-AI communities. These findings challenge assumptions around suicide risk and indicate that innovative, culturally informed preventative efforts are needed (Wexler & Gone, 2012).

One class was characterized by particularly high levels of aggression and alcohol and substance use (especially marijuana), similar to the analysis by Pena and colleagues (2012). This subgroup also was most likely to have sexual intercourse without a condom, suggesting a profile of individuals with a predisposition toward a range of risky behaviors characterized by impulsivity. These co-occurring risk factors have implications for how such adolescents are identified and how high-risk behaviors are prevented, which may include screening youth with these behaviors and connecting them to mental health resources proactively. Specifically, these adolescents may be identified by school staff based on problematic behavior, and/or seen in the juvenile justice system, drug treatment programs, or sexual health clinics and then referred for mental health services, highlighting the potential of early identification, prevention, and intervention in these settings. Prevention approaches in early childhood, such as school- or family-based interventions that target a host of risk factors, including substance use, aggression, and sexual behavior, also may be beneficial for this subgroup (Barlow et al., 2013; Whitbeck, Walls, & Welch, 2012). Interventions focused on co-occurring suicidal behavior, substance use, and aggression also are indicated (Goldston, 2004).

In contrast to the high-risk behavior group, the two remaining classes were characterized by medium- or low-risk behaviors, with the low-risk behavior class reporting few episodes of binge drinking and no use of other substances, further evidence of the range of substance use in an at-risk AI sample. The recent suicide attempt of a family member was related to membership in the low-risk behavior class, which may indicate the role of biological factors, social networks, or a combination of the two in the development of suicide risk for this subgroup (Brent et al., 2002; Burke et al., 2010). Proactive identification could be required, because these adolescents may not be as noticeably at risk as the high-risk behavior class. Clinical and preventative approaches for these subgroups may focus on suicidal behavior exclusively, including preemptive, family-based intervention after suicide attempt by a family member.

Findings related to gender and depression warrant further mention, as both are important suicide risk factors that were not significant in this analysis. Similar to the general suicide literature, AI/AN males are more likely to die by suicide, while females are more likely to ideate and attempt (Borowsky et al., 1999; Lewinsohn, Rohde, Seeley, & Baldwin, 2001). Analyses of suicide risk factors stratified by gender in non-Native samples show different risk profiles for male and female youth (King, Jiang, Czyz, & Kerr, 2014; Lewinsohn et al., 2001). For AI/AN youth, a suicide

attempt by or death of a family member and frequent alcohol/marijuana use were associated with suicide attempt history in both genders, while factors such as gang involvement and treatment for emotional concerns were risk factors for males, and gun access was a risk factor in females (Borowsky et al., 1999). As our sample was two-thirds female, it would be beneficial for future LCAs to stratify by gender to determine if latent classes of risk are different. Depression rates also may differ by gender; in one community-based study AI youth, 15% of males and 41% of females met DSM-III-R criteria for a major depressive episode (Gilder & Ehlers, 2012). Such findings speak to the potential gender differences in AI youth in this critical suicide risk factor, and to the importance of assessing both depressive diagnoses and symptoms to evaluate potential influences on AI youth at risk for suicide.

This study had several limitations. The small sample size restricted the number of indicators and predictors that could be included in the analysis. These data were collapsed across two studies and 5 years; one study was an investigation of suicide risk factors and the other, a small pilot intervention trial. Participation and decline rates may have differed across the two studies, and future prospective studies of these risk categories are indicated. Additionally, the sample represents just one tribe; analyses of data from other tribes may elicit different risk factors (Novins et al., 1999) and indicated interventions (Henry et al., 2012). Finally, individuals who made suicide attempts were included. Such individuals have been shown in Alaska Native samples to have higher rates of depression or substance abuse history than individuals who died by suicide (Wexler et al., 2012); therefore, we cannot assume the findings apply to those who die by suicide. Future analyses should include culturally specific variables, such as enculturation and perceived discrimination (Yoder et al., 2006), and variables identified as important protective factors against AI adolescent suicide, such as hope and optimism (O'Keefe & Wingate, 2013). Nonetheless, it is hoped that the subgroups proposed here can be further understood and addressed by future research in the current and other AI tribal contexts. Recommended directions for further research include evaluating the relationship between subgroup membership and outcomes related to suicide, non-suicidal self-injury, other intentional or unintentional morbidity and mortality, engagement in mental health services, and repeated emergency department utilization. Method of suicide attempt (e.g., high vs. low lethality) and impulsivity of suicidal behavior are other potential outcomes of interest.

Conclusions

Three subgroups of AI adolescents with a recent suicide attempt were identified through LCA, representing a broad continuum of substance use and aggression, with a notable proportion of adolescents engaging in few, if any, of these risk behaviors. On the other hand, key risk factors indicating level of suicide severity in other populations—namely, depression and multiple attempts—

did not differentiate across subgroups. Findings underscore the heterogeneity of AI youth who make suicide attempts and the need for appropriately tailored interventions. Subgroup analysis highlights the need for early prevention for a host of adolescent risk behaviors and risk factors, including risky sexual behavior and suicide attempt of a family member.

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