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Risk Factors for Substance Use in the American Indian/Alaska Native Community

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in conjunction with the
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by

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A Doctoral Project submitted in partial satisfaction of
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Each person whose signature appears below certifies that this doctoral project in his/her opinion is adequate, in scope and quality, as a doctoral project for the degree of Doctor of Psychology.

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ABBREVIATIONS

AI/AN	American Indian/Alaska Native
AOD	Alcohol and other drug use
CTCYS	Communities That Care Youth Survey
NP	Nonparental

ABSTRACT OF THE DOCTORAL DEFENSE

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Dr. Holly E. R. Morrell, Chairperson

Research has indicated that substance use is a significant problem in the American Indian/Alaska Native adolescent community. What is less understood are the risk and protective factors specific to this community. Using data available from the Communities That Care Youth Survey, we analyzed risk and protective factors for current (30-day) and lifetime use of smokeless tobacco, cigarettes, alcohol, marijuana, and alcohol in a sample of 5,912 AI/AN adolescents. Logistic regression analyses were used and our findings indicated that peer and family influences, as well as ease of access to alcohol and other drugs had the greatest overall impact on AI/AN substance use. We also found that religious service attendance was a risk factor for inhalant use, but a protective factor against marijuana use. Overall, our findings highlighted several gaps in the current literature regarding AI/AN cultural attitudes towards substance use and how that might affect teen substance use. It also became clear that the AI/AN community is unique in many ways and would likely benefit from interventions implemented by culturally competent clinicians with the skillset to effectively work with and for the AI/AN community

CHAPTER 1

INTRODUCTION

Substance use has long been shown to be a significant problem within the adolescent American Indian/Alaska Native (AI/AN) community (Whitbeck, Yu, Johnson, Hoyt, & Walls, 2008; Wu, Woody, Yang, Pan, & Blazer, 2011). When compared to different ethnic groups within the United States, 47.5 % of AI/AN teens reported using drugs; this is the highest among all other groups, with White teens reporting a prevalence of 39.2 %, Hispanic teens reporting 36.7%, Multi-racial teens reporting 36.4%, African American teens reporting 32.2%, and Asians or Pacific Islander teens reporting a prevalence of 23.7 %(Wu et al., 2011). Teens in this ethnic group also have the highest prevalence of substance related disorders (15%), followed by multiracial teens (9.2%), Whites (9.0%), Hispanics (7.7%), African Americans (5.0%), and Asians or Pacific Islanders (3.5%)(Wu et al., 2011) . As a whole, the AI/AN community is a relatively young group, with the 2010 US Census showing the median age as 29 years of age compared to the median age of the general population, which is 37.2 years (U.S. Census Bureau, 2010). The 2010 Census also shows that 31% of individuals in this ethnic community are under the age of 18. These numbers suggest that the elders and other role models in the AI/AN communities are dying at younger ages than the general population, leaving younger individuals in the community with an unhindered ability to influence the social norms surrounding alcohol and drug use. Without intervention, these beliefs and values have the potential to be perpetuated.

Research has shown that there are multiple negative effects and consequences of drug and alcohol abuse. For the AI/AN community, research has shown that engagement in substance use by members of this community is associated with academic failure, delinquency, unemployment and violent criminal behavior (Moncher, Holden, & Trimble, 1990). A recent study that examined the factors related to suicidal ideation in AI/AN adolescents also found that drug use was the strongest correlate of suicidal ideation (Yoder, Whitbeck, Hoyt, & Lafromboise, 2006). This is a significant finding considering that the AI/AN community leads the nation in deaths by suicide (Centers for Disease Control and Prevention, 2009). Research has also shown that deaths attributable to alcoholism among AI/AN adolescents and young adults ages 15-24 are more than 15 times those of the same age group across all races combined (Mitchell, 2008). It is clear that a greater understanding of the factors that lead to substance use is much needed for this community. Gaining more knowledge about these factors may lead to the development of more effective prevention and cessation services, which have the potential to save lives and decrease the number of substance-induced deaths in this community.

In the general population a number of factors, including parental relationships, family structure/relations, community characteristics, and peer relationships, have been shown to play a key role in understanding the developmental processes leading to substance use. Specifically, a large amount of research has focused on the aspects of the parent-child relationship and how that relates to the child's initiation of substance use. Parental factors have been shown to be both protective and risk factors for substance use in adolescents. For example, parental monitoring has been shown to be a protective factor

against drug use and other negative youth behaviors such as delinquency (Greydanus, 2005; Parker & Benson, 2004), while parental modeling of substance use and permissive attitudes towards substance abuse have been implicated in the initiation of substance use in adolescence (Hawkins, 1993; Ryan, Jorm, & Lubman, 2010). In terms of monitoring by individuals other than adolescents' parents, research has also shown that perceived police enforcement and monitoring by legal officers reduces the amount of underage drinking in adolescents over a month long period (Lipperman-Kreda, Paschall, & Grube, 2009). The quality of the parent-child relationship has also been researched and connectedness (i.e., the extent to which a child feels loved, cared for, and connected to his caregiver) has been shown to be a powerful predictor of whether an adolescent will engage in risky behaviors (i.e., early onset of alcohol and other drug [AOD] use) (Blum, 2000; Markham, Tortolero, Escobar-Chaves, Parcel, & Et Al., 2003). Furthermore, families characterized by conflict and lack of parental warmth have been implicated in an adolescent's disengagement from his or her family and engagement with deviant peers who may encourage persistent drug use (Dawes, 2000; Wu, Lu, Sterling, & Weisner, 2004). Conversely, strong family bonding has been shown to have a buffering effect on the engagement in alcohol use, even when the adolescent is living with parents who drink excessively (Kuendig & Kuntsche, 2006).

Social factors have also been shown to play a significant role in adolescent substance abuse. Research has shown that teen substance use is related to peer substance use across age groups, gender, and type of substance use (Musher-Eizenman, Holub, & Arnett, 2003). Simons-Morton (2007) identified two mechanisms by which peer relations influence substance use: socialization, which is the tendency for adolescents to conform

to peer attitudes and behaviors, and selection, which occurs when adolescents seek out peers who already have their same beliefs. Another mechanism through which peer influence may operate, which is outlined in the Prototype-Willingness Model of risk behavior, is by promoting a positive image of substance use (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008). Specifically, this model suggests that there are two paths of decision making for an adolescent: a reasoned path that is more analytical and a social reaction path that is based more on social norms regarding the risky behavior (Gerrard et al., 2008). Additionally, The Theory of Planned Behavior suggests that an adolescent's perception of the benefits of a given behavior is a predictor of engagement in risky behaviors, such as substance use (Ajzen, 1991). In addition to affecting the initiation and progression of substance use, research has shown that peer factors play a significant role in the treatment success of AOD problems in adolescents, and that some peer influences (i.e., having fewer than four AOD-using friends) can be protective factors against AOD use altogether (Ramirez, Hinman, Sterling, Weisner, & Campbell, 2012).

Community factors such as neighborhood characteristics (i.e., abandoned buildings and crime) are also associated with increased adolescent substance use (Winstanley et al., 2008). These characteristics are associated with neighborhood disorganization, which Sampson and Groves (1989) define as " the inability of a community structure to realize the common values of its residents and maintain effective control.." Neighborhood disorganization, along with community norms, also promote greater acceptance and availability of drugs, which predict increased drug use (Burrow-Sanchez, 2006). Religiosity, although less researched, is another social factor that has

also been shown to have a buffering effect against early AOD use (Mason & Spoth, 2011).

In the AI/AN community, little research has been done to either confirm the importance of the above-listed factors in teen AOD use or to identify those factors that are specific to teen AOD use in their community. What research has been conducted has focused mostly on family and social factors. For example, Rodgers and Fleming (2003) found that parental monitoring and support were protective factors against alcohol use among Native American teens. Beyond this, they also found that the presence of a nonparental adult who was willing to monitor the adolescent was a significant protective factor. These findings suggest that non-parental adults may have a variety of effects on AOD use in AI/AN adolescent. Another study found that AI/AN family structure, and specifically families where the adolescent lives with both biological parents, to be a protective factor against alcohol, marijuana, and tobacco use initiation (Lonczak, Fernandez, Austin, Marlatt, & Donovan, 2007). In addition to family factors, social factors that have been implicated in AI/AN teen substance use include peer associations and a sense of belonging at school. Previous research has shown that AI/AN youths' decisions to use drugs are more influenced by their friends' and cousins' use than by their parents' use or other adults' use (Kulis, Okamoto, Rayle, & Sen, 2006; Okamoto, Lecroy, Dustman, Hohmann-Marriott, & Kulis, 2004). Research has also found that AI/AN adolescents who feel a stronger sense of belonging in their school report lower lifetime use of alcohol and cigarettes, lower cigarette and marijuana use in the previous months, lower frequency of current use of these substances, fewer substances ever used, and later initiation into drug use than those AI/AN students who reported less of a sense of

belonging (Galliher, Evans, & Weiser, 2007; Napoli, Marsiglia, & Kulis, 2003). These results coincide with findings that highlight self-efficacy and refusal skills as major factors in predicting child drug abuse and early initiation in AI/AN adolescents (Galliher et al., 2007). Specifically, research indicates that the extent to which an individual feels accepted and a part of his or her school community is predictive of self-efficacy and refusal skills in the AI/AN community, both of which predict child drug use and experimentation (Galliher et al., 2007).

Taken together, these findings highlight differences and similarities between the AI/AN community and the general population. Specifically, parental monitoring and peer influences seem to have a large influence on AOD use in both the AI/AN community and general population. Nonparental monitoring, however, may have more of an influence on AOD use in the AI/AN community than in the general population. These similarities and differences could have important clinical implications for the types of interventions that will be effective in decreasing AOD use in AI/AN adolescents. Nevertheless, very little is known about the risk and protective factors associated with substance use among AI/AN adolescents.

Given the serious consequences of substance abuse and the current lack of empirically derived, culturally informed treatment services for AI/AN individuals, it is imperative that we learn more about the factors that influence AOD use in the AI/AN community. There is a wealth of research focused on the general population that has led to a greater understanding of how to prevent and intervene when adolescent AOD use becomes serious. In comparison, however, there is a relative dearth of research that specifically focuses on the AI/AN community. The staggering statistics that indicate that

adolescent AOD use is particularly high and is associated with particularly severe consequences in the AI/AN population serves as an indication that more research should be done to uncover the risk and protective factors that may be specific to this community. This type of information would then become the foundation that is needed to create and revise interventions that are effective at preventing and decreasing AOD adolescent use in the AI/AN community.

The first goal of this study is to determine if the same protective and risk factors that have been empirically validated for the general adolescent population are applicable to the AI/AN adolescent community. The second goal of the present study is to determine if there are risk and protective factors for AOD adolescent in the AI/AN community that are unique to this ethnic group. Specifically, we hypothesize that negative peer influences, negative family influences, and increased ease of access to AOD in the community will all be risk factors in predicting adolescent AOD use in the AI/AN community. We also hypothesize that positive influences from non-parental adults, engagement in religious experiences, and stronger school bonding will be protective factors against AOD use in the AI/AN community. These hypotheses are based on the currently available literature for both the general population and AI/AN community, as reviewed above. The third goal of the present study is to determine whether the same set of risk and protective factors predict different types of substance use (e.g., cigarettes, smokeless tobacco, alcohol, marijuana, and inhalants). We hypothesize that the risk and protective factors identified will predict the different types of substance use equally.

CHAPTER 2

METHODS

Participants

This study is based on a sample of 5,912 self-identified Native American middle school and high school students from 23 states across the country who participated in the 2000, 2001, and 2002 Communities That Care (CTC) Survey and who provided complete data for all study variables. The majority of the participants were 13 years old (20.9%), in the 8th grade (24.9%), and male (55.5%). Substance use rates varied across the types of different drugs (licit vs. illicit), with a majority of participants having used alcohol in their lifetime (52.9%). Illicit substance use was low overall, with cigarettes being the most commonly used illicit substance in participants' lifetimes (45.9%), followed closely by marijuana (32.1%). Additional descriptive statistics are presented in Tables 1 and 2.

Procedures

The Communities That Care Youth Survey (CTCYS)

This study utilized the CTCYS as the basis for examination of the risk and protective factors of current and lifetime use for AI/AN youth. The CTCYS is an ongoing cross-sectional survey of perceptions and behaviors of students in grades 6 through 12, and is administered in school settings across the nation. In brief, schools elect to participate on a voluntary basis and the teacher completes the survey administration during one classroom period. Participation is voluntary and anonymous and teachers are instructed to remain at the front of the room during survey administration. Parents receive a letter at least two

weeks prior to survey administration informing them of the survey and offering an opportunity to decline their child's participation or sign and return an attached release form. All surveys in a given school are completed on the same day and same class period. At the end of the class period students place their survey in an envelope, which is sealed by the last student.

A total of 23 states and 837 zip codes are represented in the CTCYS normative database. The survey is designed to assess levels of risk and protection within the student's peer group, family, school, and community. The survey includes questions about alcohol, tobacco, drugs (AODs), and antisocial behaviors such as carrying guns to school or selling illegal drugs. Respondents' personal information includes age, gender, race-ethnicity, and residential location (urban/non-urban). Validation studies have established the reliability and validity of the survey's risk and protective scales across gender, racial/ethnic, and age groups (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002; Glaser, Van Horn, Arthur, Hawkins, & Catalano, 2005), and the utility of the scales in predicting a community's level of ATOD prevalence (Hawkins, Van Horn, & Arthur, 2004).

Sample

The present study is an analysis of publically available data on the CTCYS. The data were collected on 310,171 students in grades 6-12 between January 1, 2000 and December 31, 2002. Of the original 310,171 respondents 5,912 students identified themselves as AI/AN and were given further consideration for inclusion in the analyses. The public use database includes some records that were flagged during data cleaning

and validation as likely to be of poor quality. Data quality criteria include checks for truthfulness (judged by response about use of a fictitious substance or reporting of an implausibly high rate of AOD use and antisocial behaviors), inconsistent responses (more than one inconsistency in AOD use items or antisocial behaviors), and missing data (more than 25 percent of the items left blank). For purposes of this research, we used the original validation procedures to eliminate all cases flagged as poor quality. Sample characteristics are provided in Table 1.

Table 1
Descriptive Characteristics of Sample

Characteristics	N	%
Age		
10	61	1.0
11	373	6.3
12	982	16.6
13	1234	20.9
14	1051	17.8
15	766	13.0
16	637	10.8
17	442	7.5
18	179	3.0
19 or Older	161	2.7
Grade		
6^{th}	1145	19.4
7^{th}	990	16.7
8^{th}	1475	24.9
9^{th}	519	8.8
10^{th}	946	16.0
11^{th}	287	4.9
12^{th}	473	8.0
Gender		
Male	3281	55.5
Female	2465	41.7

Materials

Demographic Characteristics

Participants reported their gender and what grade they were in.

Substance Use

Students were asked if they had ever used a variety of substances in their lifetime and how often they had used those substances during the past thirty days and in their lifetime. The possible response options varied depending on the type of substances being asked about. The substances focused on in this investigation are alcohol, inhalants, marijuana, smokeless tobacco, and cigarettes were chosen based on the most recent adolescent substance use prevalence data (Johnston, O'malley, Bachman, & Schulenberg, 2012).

Alcohol

Students were asked on how many occasions they had more than just a few sips of an alcoholic beverage (beer, wine or hard liquor) in their lifetime (seven possible responses ranged from “0 occasions” to “40 or more occasions”). Students were also asked on how many occasions they had more than just a few sips of an alcoholic beverage (beer, wine, or hard liquor) during the past thirty days (seven possible responses ranged from “0 occasions” to “40 or more occasions”).

Inhalants

Students were asked on how many occasions they had sniffed glue, breathed the contents of an aerosol spray can, or inhaled other gases or sprays in order to get high in their lifetime (seven possible responses ranged from "0 occasions" to "40 or more occasions"). Students were also asked on how many occasions they had sniffed glue, breathed the contents of an aerosol spray can, or inhaled other gases or sprays in order to get high during the past thirty days (seven possible responses ranged from "0 occasions" to "40 or more occasions").

Marijuana

Students were asked on how many occasions they used marijuana (weed, pot) or hashish (hash, hash oil) in their lifetime (seven possible responses ranged from "0 occasions" to "40 or more occasions"). Students were also asked on how many occasions they used marijuana (weed, pot) or hashish (hash, hash oil) in the past thirty days (seven possible responses ranged from "0 occasions" to "40 or more occasions").

Tobacco

Students were asked if they had ever used smokeless tobacco (chew, snuff, plug, dipping tobacco, chewing tobacco) or smoked cigarettes in their lifetime (five possible responses ranged from "Never" to "Regularly now"). Students were also asked how frequently they used smokeless tobacco or smoked cigarettes in the past thirty days (five possible responses ranged from "Never" to "More than once a day").

Peer Influences

Students were asked to think about their four best friends and to identify the number of times those friends engaged in using or selling different substances in the past year (five possible responses ranged from "None" to "4"). Students were also asked what the chances were that they would be seen as cool if they engaged in using different substances (five possible responses ranged from "No or very little chance" to "very good chance").

Family Influences

Students were asked how wrong their parent would think it was for them to smoke or drink (four possible responses ranged from "Very wrong" to "Not wrong at all"). Students were also asked if their parents know where they (the students) are and what they do when not at home, if their parents would know if they did not come home on time, and the likelihood of being caught by their parents if they engaged in substance use (four possible responses were "NO!", "no", "yes", and "YES!"). Last, students were asked if their families had clear rules about alcohol and drug use (four possible responses were "NO!", "no", "yes", and "YES!").

Religiosity

Students were asked how often they attend religious services (four possible responses ranged from "Never" to "About once a week or more").

Ease of Access to AOD

Students were asked how easy it is for them to obtain drugs and alcohol in their community (four possible responses ranged from “Very hard” to “Very easy”).

Nonparental Influences

Students were asked how wrong the adults (over the age of twenty-one) would think it was for kids their age to use alcohol and other drugs (four response options ranged from “Very wrong” to “Not wrong at all”). Students were also asked if there were a lot of adults in their neighborhood who they feel comfortable talking with, and if there were people in their neighborhood who were proud of them and see when they do a good job (four possible responses were “NO!”, “no”, “yes”, and “YES!”).

Sense of Belonging in School

A sense of belonging in school was measured by looking at three main areas: how often the students changed schools, how committed the students were to school, and how the students performed academically.

Change of School

Students were asked how often they had changed schools since kindergarten, including changes from elementary to middle school, and middle school to high school (five possible responses ranged from “Never” to “7 or more times”). Students were also asked if they had changed schools in the past year, including moving from elementary to

middle school, or from middle school to high school (possible responses were “Yes” or “No”).

School Commitment

Students were asked how often they felt that the schoolwork they are assigned was meaningful and important (five possible responses ranged from “Never” to “Almost Always”). Students were also asked how interesting most courses were to them (five possible responses ranged from “Very dull” to “Very interesting and stimulating”) and how important they thought learning in school was going to be for their later life (five possible responses ranged from (“Not important at all” to “Very important”). Lastly, students were asked how often in the past year they enjoyed being in school, hated being in school, and tried to do their best work (five possible responses ranged from “Never” to “Almost Always”).

Academic Performance

Students were asked what their grades were like last year (five possible responses ranged from “Mostly Fs” to “Mostly As”) and if their school grades were better than the grades of most of the students in their class (four possible responses were “NO!”, “no”, “yes”, and “YES!).

Statistical Analyses

Ten logistic regression analyses were used to predict five types of current (i.e., use in past 30 days) and lifetime substance use among AI/AN adolescents. Based on

current data, the most prevalent drugs in the adolescent community are inhalants, marijuana, alcohol, tobacco, and prescription stimulants (Johnston et al., 2012). As such, all of these drugs, except for prescription stimulants, which were not included in the public-use dataset, served as study outcome variables. Predictor variables included peer influences, family influences, religiosity, ease of access to AOD, nonparental influences, and a sense of belonging in school. Table 2 provides the means and standard deviations of each predictor variable by current and lifetime use of each substance examined.

Prior to analysis, the assumptions of logistic regression were tested. The expected frequencies for each outcome variable was tested and found to be lower than expected. This was corrected by collapsing each level of the outcome variables into two categories, "Did not use" and "Used". Linearity in the logit was tested using the Box-Tidwell approach (Tabachnick & Fidell, 2013). Based upon this approach, the following predictor

Table 2

Means and Standard Deviations of Predictor Variables by Type of Substance Use

	Smokeless Tobacco Use		Cigarette Use		Alcohol Use		Inhalant Use		Marijuana Use	
	30-Day	Lifetime	30-Day	Lifetime	30-Day	Lifetime	30-Day	Lifetime	30-Day	Lifetime
Friends use AOD	4.29 (4.37)	4.60 (4.64)	4.28 (4.43)	4.12 (4.29)	4.10 (4.26)	4.16 (4.35)	3.88 (4.15)	4.05 (4.24)	4.10 (4.23)	4.16 (4.26)
Friends think AOD use is cool	2.26 (3.46)	3.11 (4.09)	2.22 (3.42)	2.27 (3.43)	2.22 (3.39)	2.27 (3.49)	1.98 (3.20)	2.26 (3.43)	2.10 (3.36)	2.32 (3.54)
Family negative beliefs about AOD	1.43 (2.35)	1.97 (2.91)	1.45 (2.19)	1.31 (2.10)	1.13 (2.00)	1.20 (2.20)	.933 (1.85)	1.32 (2.42)	1.16 (2.12)	1.38 (2.31)
Parental monitoring	5.61 (2.84)	5.32 (2.73)	5.50 (2.76)	5.16 (2.72)	5.16 (2.56)	5.36 (2.53)	4.92 (3.03)	4.88 (2.82)	5.03 (2.89)	4.91 (2.95)
Family has clear rules about AOD	1.91 (1.14)	1.95 (1.16)	1.88 (1.11)	1.92 (1.71	1.91 (1.16)	2.01 (1.11)	1.79 (1.27)	1.85 (1.17)	1.82 (1.24)	1.86 (1.20)
How often attends religious services	1.34 (1.14)	1.44 (1.21)	1.20 (1.12)	1.29 (1.13)	1.32 (1.14)	1.29 (1.11)	1.35 (1.19)	1.36 (1.20)	1.33 (1.18)	1.29 (1.18)
How easy to obtain AOD	3.81 (3.44)	4.29 (3.51)	4.33 (3.70)	4.13 (3.54)	3.85 (3.52)	4.16 (3.47)	3.14 (3.46)	3.49 (3.55)	3.40 (3.51)	3.73 (3.52)
NP negative beliefs about AOD use	2.22 (2.88)	2.50 (3.06)	2.40 (2.92)	2.62 (2.95)	2.48 (2.98)	2.50 (2.88)	1.69 (2.54)	1.98 (2.67)	1.79 (2.70)	2.23 (2.83)
NP adult you're comfortable talking to	1.35 (1.18)	1.23 (1.18)	1.04 (1.14)	1.22 (1.15)	1.18 (1.12)	1.15 (1.14)	1.13 (1.16)	1.25 (1.17)	1.17 (1.16)	1.18 (1.11)
NP adult notices good behavior	2.45 (1.98)	2.20 (2.04)	1.94 (1.92)	2.28 (2.06)	2.12 (1.86)	2.03 (1.92)	2.17 (2.07)	2.29 (2.00)	2.19 (2.08)	2.15 (1.88)
Changed schools in the past year[a]	35 (9.3)	251 (20)	32 (8.1)	40 (10.6)	44 (8.9)	47 (9.9)	98 (16.0)	63 (12.3)	96 (16.0)	61 (12.4)
Changed schools since kindergarten	1.42 (1.44)	1.28 (1.38)	1.48 (1.53)	1.35 (1.37)	1.28 (1.37)	1.25 (1.37)	1.19 (1.29)	1.23 (1.33)	1.28 (1.30)	1.39 (1.37)
Grades last year	2.54 (1.17)	2.48 (1.21)	2.55 (1.15)	2.54 (1.16)	2.55 (1.10)	2.55 (1.11)	2.57 (1.10)	2.59 (1.11)	2.53 (1.09)	2.59 (1.10)
Grades better than other classmates	1.31 (.975)	1.31 (.976)	1.29 (.963)	1.35 (.947)	1.31 (.937)	1.32 (.926)	1.36 (.945)	1.31 (.939)	1.35 (.965)	1.31 (.947)
Commitment to school	10.23 (5.74)	11.64 (6.17)	10.75 (5.85)	10.45 (5.80)	10.44 (5.66)	10.69 (5.79)	10.36 (5.64)	10.43 (5.73)	10.25 (5.49)	10.48 (5.66)

[a]Categorical variable; Ns and (%s) of "yes" responses are reported.

variables had to be transformed: nonparental (NP) AOD beliefs and parental monitoring when predicting 30-day cigarette use; parental monitoring, peer AOD use, commitment to school, and NP adults likely to notice good behavior when predicting marijuana use; and NP AOD beliefs when predicting 30-day marijuana use. As logistic regression is sensitive to multicollinearity, a linear regression analysis was run to test for problems with multicollinearity. Tolerance and VIF values were found to be normal, indicating no problems with multicollinearity. Lastly, the standardized residuals were evaluated and all cases with residual values greater than three were removed from the logistic regression analysis.

CHAPTER 3

RESULTS

Given the complexity of the results, a summary of the effects of all predictor variables on all substance use outcomes is provided in Table 3. However, a detailed description of all results is provided below, with reference to more complete tables for each substance

Table 3
Summary of the directions of effects of predictor variables on substance use outcomes.

	Alcohol Use		Marijuana Use		Inhalant Use		Cigarette Use		Smokeless Tobacco Use	
Predictor	30-Day	Lifetime	30-Day	Lifetime	30-Day	Lifetime	30-Day	Lifetime	30-Day	Lifetime
Friends use AOD	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Friends think AOD use is cool	↑	↑	↑	ns	↑	↑	↑	↑	↑	↑
Family negative beliefs about AOD	↑	↑	↑	↑	↑	↑	↑	ns	↑	↑
Parental monitoring	↓	↓	↓	↓	ns	ns	ns	ns	↓	↓
Family has clear rules about AOD	ns	ns	↓	↓	ns	ns	ns	ns	ns	ns
How often attends religious services	ns	ns	ns	↓	↑	ns	ns	ns	ns	ns
How easy to obtain AOD	↑	↑	↑	↑	ns	↑	↑	↑	ns	↑
NP negative beliefs about AOD use	↑	ns	ns	↑	↑	ns	↓	ns	↑	↑
NP adult you're comfortable talking to	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
NP adult notices good behavior	ns	ns	ns	ns	↑	ns	ns	↑	ns	ns
Changed schools in the past year	ns	↑	↓	↑	ns	ns	ns	ns	ns	ns
Changed schools since kindergarten	ns	↑	ns	↑	↑	↑	ns	↑	ns	ns
Increase in grades last year	ns	ns	↓	↓	ns	ns	↓	↓	↓	↓
Grades better than other classmates	ns	ns	ns	ns	ns	ns	↓	↓	ns	ns
Commitment to school	↑	↑	ns	ns	↑	↑	ns	↓	ns	ns

Smokeless Tobacco

Results of the logistic regression analyses indicated that multiple protective and risk factors were statistically significant predictors of smokeless tobacco use among AI/AN adolescents (Table 4). The analyses indicated that for every one-unit increase in peers that used AODs, the odds of using smokeless tobacco increased by 12.8% (*OR* = 1.128, 95% CI[1.096, 1.161]) for lifetime use and increased by 12.9% for current use (*OR* = 1.129, 95%CI[1.088, 1.171]). For every one-unit increase in peers who think AOD use is cool, the odds of using smokeless tobacco increased by 5% for lifetime use (*OR* = 1.05, 95%CI[1.019, 1.082]) and 9% for current use (*OR* = 1.09, 95%CI[1.05, 1.13]). For every one-unit increase in familial negative beliefs about AOD use, the odds of using smokeless tobacco increased by 7.4% for lifetime use (*OR* = 1.077, 95%CI[1.021, 1.129] and 8.9% for current use (*OR* = 1.089, 95%CI[1.031, 1.151]).

For every one-unit increase in parental monitoring, the odds of using smokeless tobacco decreased by 6.7% for lifetime use (*OR* = .933, 95%CI[.995, .985]) and 12.3% for current use (*OR* = .877, 95%CI[.882, .935]). For every one-unit increase in ease of access in obtaining AOD, the odds of using smokeless tobacco increased by 7.7% for lifetime use (*OR* = 1.077, 95%CI[1.037,1.118]); ease of access did not significantly predict current use. For every one-unit increase in nonparental negative beliefs about AOD use, the odds of using smokeless tobacco increased by 5.5% for lifetime use (*OR* = 1.055, 95%CI[1.010, 1.102]) and 7.1% for current use (*OR* = 1.071, 95%CI[1.016, 1.129]). Lastly, for every one-unit increase in grades the previous school year, the odds of using smokeless tobacco decreased by 16.8% for lifetime use (*OR* = .832, 95%CI[.750, .923]) and 18.8% for current use (*OR* = .812, 95%CI[.721, .913]).

Table 4

Results of Logistic Regression Analysis Predicting Lifetime and 30-day use of Smokeless Tobacco in AI/AN adolescents.

Dependent Variable	Predictor Variable	B	Wald Statistic	*p*-value	OR	95%CI
30-Day Use	Peer Influence					
	Friends use AOD	.121	41.61	<.001	1.129	[1.088. 1.171]
	Friends think AOD use is cool	.090	26.62	<.001	1.094	[1.058, 1.133]
	Family Influence					
	Family negative beliefs about AOD	.086	9.15	.002	1.089	[1.031, 1.151]
	Parental monitoring	-.131	15.88	<.001	.877	[.882, .935]
	Family has clear rules about AOD	.002	0.001	.975	1.002	[.874, 1.148]
	Religiosity					
	How often attends religious services	.085	2.340	.126	1.089	[.976, 1.214]
	Ease of Access to AOD					
	How easy to obtain AOD	.010	.153	.696	1.010	[.961, 1.061]
	Nonparental (NP) Influences					
	NP negative beliefs about AOD use	.069	6.590	.010	1.071	[1.016, 1.129]
	NP adult you're comfortable talking to	.076	.361	.548	1.079	[.842, 1.381]
	NP adult notices good behavior	.063	0.736	.391	1.065	[.923, 1.228]
	School Belonging and Grades					
	Changed schools in the past year	-.191	1.900	.167	.826	[.630, 1.083]
	Changed schools since kindergarten	-.044	.716	.397	.957	[.865, 1.059]
	Grades last year	-.209	12.01	.001	.812	[.721, .913]
	Grades better than other classmates	.025	0.107	.743	1.025	[.884, 1.189]
	Commitment to school	.024	2.930	.087	1.024	[.997, 1.052]

Note: B = the regression coefficient, or natural log of the odds ratio; OR = Odds Ratio.

Table 4 Cont'd.

Results of Logistic Regression Analysis Predicting Lifetime and 30-day use of Smokeless Tobacco in AI/AN adolescents.

Dependent Variable	Predictor Variable	B	Wald Statistic	*p*-value	OR	95%CI
Lifetime Use	Peer Influence					
	Friends use AOD	.120	68.45	< .001	1.128	[1.096, 1.161]
	Friends think AOD use is cool	.049	10.11	.001	1.050	[1.019, 1.082]
	Family Influence					
	Family negative beliefs about AOD	.071	7.8	.005	1.074	[1.021, 1.129]
	Parental monitoring	-.069	6.34	.012	.933	[.885, .985]
	Family has clear rules about AOD	.064	1.14	.285	1.066	[.948, 1.198]
	Religiosity					
	How often attends religious services	.079	3.01	.083	1.083	[.990, 1.184]
	Ease of Access to AOD					
	How easy to obtain AOD	.074	14.87	<.001	1.077	[1.037, 1.118]
	Nonparental (NP) Influences					
	NP negative beliefs about AOD use	.054	5.84	.016	1.056	[1.010, 1.102]
	NP adult you're comfortable talking to	.077	.565	.452	1.080	[.883, 1.322]
	NP adult notices good behavior	.005	0.007	.931	1.005	[.894, 1.131]
	School Belonging and Grades					
	Changed schools in the past year	-.170	2.35	.125	.843	[.678, 1.049]
	Changed schools since kindergarten	-.003	0.003	.953	.997	[.917, 1.085]
	Grades last year	-.184	12.07	.001	.832	[.750, .923]
	Grades better than other classmates	.108	2.930	.087	1.114	[.984, 1.260]
	Commitment to school	.017	2.180	.140	1.017	[.994, 1.040]

Note: B = the regression coefficient, or natural log of the odds ratio; OR = Odds Ratio.

Marijuana

Results of the logistic regression analyses indicated that multiple protective and risk factors were statistically significant predictors of marijuana use among AI/AN adolescents (Table 5). The analyses indicated that for every one-unit increase in peers that used AODs, the odds of using marijuana increased by 1,846.8% (*OR* = 19.468, 95% CI[12.867, 29.457]) for lifetime use and 28.2% for current use (*OR* = 1.282, 95%CI[1.231, 1.335]). For every one-unit increase in peers who think AOD use is cool, the odds of using marijuana increased by 11.4% for current use (*OR* = 1.114, 95%CI[1.071, 1.159]); lifetime use was not significantly affected. For every one-unit increase in familial negative beliefs about AOD use, the odds of using marijuana increased by 11.4% for lifetime use (*OR* = 1.114, 95%CI[1.046, 1.187]) and 14.8% for current use (*OR* = 1.148, 95%CI[1.082, 1.219]). For every one-unit increase in parental monitoring, the odds of using marijuana decreased by 53.6% for lifetime use (*OR* = .464, 95%CI[.234, .921]) and 7.5% for current use (*OR* = .925, 95%CI[.860, .995]). For every one-unit increase in clear familial rules about AOD, the odds of using marijuana decreased by 12.3% for lifetime use (*OR* = .877, 95% CI[.768, 1.002]) and 14.7% for current use (*OR* = .853, 95% CI[.731, .996]). For every one-unit increase in religious service attendance, the odds of using marijuana decreased by 10.1% for lifetime use (*OR* = .899, 95% CI[.811, .955]); current use was not influenced by religiosity.

For every one-unit increase in ease of access in obtaining AOD, the odds of using marijuana increased by 20.8% for lifetime use (*OR* = 1.208, 95%CI[1.158,1.260]) and 9.1% for current use (*OR* = 1.091, 95% CI[1.029, 1.156]). For every one-unit increase in nonparental negative beliefs about AOD use, the odds of using marijuana increased b

Table 5

Results of Logistic Regression Analysis Predicting Lifetime and 30-day use of Marijuana in AI/AN adolescents.

Dependent Variable	Predictor Variable	B	Wald Statistic	*p*-value	OR	95%CI
30-Day Use	Peer Influence					
	Friends use AOD	.248	145.27	<.001	1.282	[1.231, 1.335]
	Friends think AOD use is cool	.108	29.35	<.001	1.114	[1.071, 1.159]
	Family Influence					
	Family negative beliefs about AOD	.138	20.83	<.001	1.148	[1.082, 1.219]
	Parental monitoring	-.078	4.36	.037	.925	[.860, .995]
	Family has clear rules about AOD	-.159	4.02	.045	.853	[.731, .996]
	Religiosity					
	How often attends religious services	-.094	2.200	.138	.910	[.804, 1.031]
	Ease of Access to AOD					
	How easy to obtain AOD	.087	8.600	.003	1.091	[1.029, 1.156]
	Nonparental (NP) Influences					
	NP negative beliefs about AOD use	-.143	.244	.621	.867	[.492, 1.528]
	NP adult you're comfortable talking to	.053	.131	.718	1.054	[.792, 1.404]
	NP adult notices good behavior	.061	0.522	.470	1.063	[.901, 1.255]
	School Belonging and Grades					
	Changed schools in the past year	-.372	5.68	.017	.689	[.508, .936]
	Changed schools since kindergarten	-.021	.133	.716	.979	[.874, 1.097]
	Grades last year	-.244	11.66	.001	.784	[.681, .901]
	Grades better than other classmates	-.101	1.27	.259	.904	[.759, 1.077]
	Commitment to school	.000	.001	.982	1.000	[.969, 1.032]

Note: B = the regression coefficient, or natural log of the odds ratio; OR = Odds Ratio.

Table 5 Cont'd.

Results of Logistic Regression Analysis Predicting Lifetime and 30-day use of Marijuana in AI/AN adolescents.

Dependent Variable	Predictor Variable	B	Wald Statistic	*p*-value	OR	95%CI
Lifetime Use	Peer Influence					
	Friends use AOD	2.960	197.41	<.001	19.468	[12.867, 29.457]
	Friends think AOD use is cool	.031	2.85	.091	1.032	[.995, 1.070]
	Family Influence					
	Family negative beliefs about AOD	.108	11.21	.001	1.114	[1.046, 1.187]
	Parental monitoring	-.767	4.82	.028	.464	[.234, .921]
	Family has clear rules about AOD	-.131	3.70	.054	.877	[.768, 1.002]
	Religiosity					
	How often attends religious services	-.107	4.22	.040	.899	[.811, .995]
	Ease of Access to AOD					
	How easy to obtain AOD	.189	76.23	<.001	1.208	[1.158, 1.260]
	Nonparental (NP) Influences					
	NP negative beliefs about AOD use	.052	4.19	.041	1.054	[1.002, 1.108]
	NP adult you're comfortable talking to	-.087	.635	.426	.916	[.739, 1.136]
	NP adult notices good behavior	.183	1.75	.185	1.201	[.916, 1.574]
	School Belonging and Grades					
	Changed schools in the past year	.266	4.20	.040	1.305	[1.012, 1.684]
	Changed schools since kindergarten	.184	13.99	<.001	1.202	[1.092, 1.324]
	Grades last year	-.298	21.87	<.001	.743	[.655, .841]
	Grades better than other classmates	-.028	.146	.702	.972	[.841, 1.123]
	Commitment to school	-.266	.869	.351	.767	[.439, 1.340]

Note: B = the regression coefficient, or natural log of the odds ratio; OR = Odds Ratio.

5.4% for lifetime use (*OR* = 1.054, 95%CI[1.002, 1.108]); current use was not influenced by nonparental negative beliefs. The odds of being a lifetime marijuana user were 30.5% greater for AI/AN teens who changed schools in the past year (OR = 1.305, 95% CI[1.012, 1.684]), compared to those who had not changed schools in the past year. For current use of marijuana, the odds were 31.1% lower for those AI/AN teens that changed schools in the past year (OR = .689, 95% CI[.508, .936]) than for those who had not changed schools in the past year. For every one-unit increase in the number of times an AI/AN teen changed schools since kindergarten, the odds of using marijuana increased by 20.2% for lifetime use (*OR* = 1.202, 95% CI[1,092, 1.324]); current use was not influenced by the number of times a teen had changed schools since kindergarten. Lastly, for every one-unit increase in grades the previous school year, the odds of using marijuana decreased by 25.7% for lifetime use (*OR* = .743, 95%CI[.655, .841]) and decreased by 21.6% for current use (*OR* = .784, 95%CI[.681, .901]).

Inhalants

Results of the logistic regression analyses indicated that multiple protective and risk factors were statistically significant predictors of inhalant use among AI/AN adolescents (Table 6). The analyses indicated that for every one-unit increase in peers that used AODs, the odds of using inhalants increased by 7.6% (*OR* = 1.076, 95% CI[1.046, 1.108]) for lifetime use and 5.9% for current use (*OR* = 1.059, 95%CI[1.017, 1.102]). For every one-unit increase in peers who think AOD use is cool, the odds of using inhalants increased by 9.5% for lifetime use (*OR* = 1.095, 95%CI[1.064, 1.127

Table 6
Results of Logistic Regression Analysis Predicting Lifetime and 30-day use of Inhalants in AI/AN adolescents.

Dependent Variable	Predictor Variable	B	Wald Statistic	*p*-value	OR	95%CI
30-Day Use	Peer Influence					
	Friends use AOD	.057	7.72	.005	1.059	[1.017, 1.102]
	Friends think AOD use is cool	.147	61.51	<.001	1.158	[1.116, 1.201]
	Family Influence					
	Family negative beliefs about AOD	.152	26.13	<.001	1.165	[1.098, 1.235]
	Parental monitoring	-.031	.724	.395	.969	[.902, 1.042]
	Family has clear rules about AOD	-.066	.716	.397	.936	[.804, 1.090]
	Religiosity					
	How often attends religious services	.147	5.70	.017	1.158	[1.027, 1.306]
	Ease of Access to AOD					
	How easy to obtain AOD	-.013	.213	.645	.987	[.935, 1.042]
	Nonparental (NP) Influences					
	NP negative beliefs about AOD use	.083	8.12	.004	1.086	[1.026, 1.150]
	NP adult you're comfortable talking to	-.219	2.42	.119	.803	[.610, 1.058]
	NP adult notices good behavior	.191	5.61	.018	1.210	[1.033, 1.417]
	School Belonging and Grades					
	Changed schools in the past year	-.283	3.53	.060	.754	[.561, 1.012]
	Changed schools since kindergarten	.119	4.61	.032	1.126	[1.010, 1.255]
	Grades last year	.004	.004	.950	1.004	[.881, 1.145]
	Grades better than other classmates	-.043	.274	.601	.958	[.814, 1.126]
	Commitment to school	.065	18.07	<.001	1.067	[1.036, 1.100]

Note: B = the regression coefficient, or natural log of the odds ratio; OR = Odds Ratio.

Table 6 Cont'd.

Results of Logistic Regression Analysis Predicting Lifetime and 30-day use of Inhalants in AI/AN adolescents.

Dependent Variable	Predictor Variable	B	Wald Statistic	*p*-value	OR	95%CI
Lifetime Use	Peer Influence					
	Friends use AOD	.074	24.61	<.001	1.076	[1.046, 1.108]
	Friends think AOD use is cool	.091	37.63	<.001	1.095	[1.064, 1.127]
	Family Influence					
	Family negative beliefs about AOD	.110	19.67	<.001	1.117	[1.063, 1.172]
	Parental monitoring	-.023	0.71	.399	.977	[.925, 1.031]
	Family has clear rules about AOD	.070	1.33	.248	1.072	[.953, 1.206]
	Religiosity					
	How often attends religious services	.061	1.75	.186	1.062	[.971, 1.162]
	Ease of Access to AOD					
	How easy to obtain AOD	.052	6.88	.009	1.053	[1.013, 1.095]
	Nonparental (NP) Influences					
	NP negative beliefs about AOD use	.037	2.68	.102	1.038	[.993, 1.084]
	NP adult you're comfortable talking to	.034	.106	.745	1.034	[.844, 1.268]
	NP adult notices good behavior	.023	.147	.702	1.024	[.909, 1.153]
	School Belonging and Grades					
	Changed schools in the past year	-.125	1.23	.266	.882	[.707, 1.100]
	Changed schools since kindergarten	.093	4.78	.029	1.097	[1.010, 1.192]
	Grades last year	-.051	.953	.329	.950	[.858, 1.053]
	Grades better than other classmates	.000	.000	.999	1.000	[.883, 1.132]
	Commitment to school	-.033	9.22	.002	.968	[.947, .988]

Note: B = the regression coefficient, or natural log of the odds ratio; OR = Odds Ratio.

and 15.8% for current use (*OR* = 1.158, 95%CI[1.116, 1.201]). For every one-unit increase in familial negative beliefs about AOD use, the odds of using inhalants increased by 11.7% for lifetime use (*OR* = 1.117, 95%CI[1.063, 1.172]) and 16.5% for current use (*OR* = 1.165, 95%CI[1.098, 1.235]). For every one-unit increase in religious service attendance, the odds of using inhalants increased by 15.8% for current use (*OR* = 1.158, 95% CI[1.027, 1.306]); lifetime use was not influenced by religiosity.

For every one-unit increase in ease of access in obtaining AOD, the odds of using inhalants increased by 5.3% for lifetime use (*OR* = 1.053, 95%CI[1.013,1.095]); current use was not influenced by ease of AOD access. For every one-unit increase in nonparental negative beliefs about AOD use, the odds of using inhalants increased by 8.6% for current use (*OR* = 1.086, 95%CI[1.026, 1.150]); lifetime use was not influenced by nonparental negative beliefs. For every one-unit increase in the number of nonparental adults who notice good behavior, the odds of using inhalants increased by 21% for current use (*OR* = 1.210, 95%CI[1.033, 1.417]); lifetime use was not influenced by nonparental adults noticing good behavior. For every one-unit increase in the number of times an AI/AN teen changed schools since kindergarten, the odds of using inhalants increased by 9.7% for lifetime use (*OR* = 1.097, 95% CI[1.010 1.192]) and 12.6% for current use (*OR* = 1.126, 95%CI[1.010, 1.255]). Lastly, for every one-unit increase in commitment to school, the odds of using inhalants increased by 5.2% for lifetime use (*OR* = 1.052, 95%CI[1.028, 1.076]) and 6.7% for current use (*OR* = 1.067, 95%CI[1.036,1.100]).

Cigarettes

Results of the logistic regression analyses indicated that multiple protective and risk factors were statistically significant predictors of cigarette use among AI/AN adolescents (Table 7). The analyses indicated that for every one-unit increase in AI/AN teens who had peers that used AODs, the odds of using cigarettes increased by 22.3% (*OR* = 1.223, 95% CI[1.190, 1.257]) for lifetime use and 20.6% for current use (*OR* = 1.206, 95%CI[1.164, 1.249]). For every one-unit increase in peers who think AOD use is cool, the odds of using cigarettes increased by 6.1% for current use (*OR* = 1.061, 95%CI[1.029, 1.094]) and 8.0% for lifetime use (*OR* = 1.080, 95%CI[1.04, 1.11]). For every one-unit increase in familial negative beliefs about AOD use, the odds of using cigarettes increased by 14.4% for current use (*OR* = 1.144, 95%CI[1.082, 1.210]); lifetime use was not influenced by familial negative beliefs. For every one-unit increase in ease of access in obtaining AOD, the odds of using cigarettes increased by 19.3% for lifetime use (*OR* = 1.193, 95%CI[1.156,1.232]) and 11.6% for current use (*OR* = 1.116, 95% CI[1.060, 1.176]).

For every one-unit increase in nonparental negative beliefs about AOD use, the odds of using cigarettes decreased by 39.1% for current use (*OR* = .609, 95%CI[.371, .999]); lifetime use was not influenced by nonparental negative beliefs. For every one-unit increase in the number of nonparental adults who notice good behavior, the odds of using cigarettes increased by 10.5% for lifetime use (*OR* = .895, 95%CI[.805, .995]); current use was not influenced by nonparental adults who notice good behavior. For every one-unit increase in the number of times an AI/AN teen changed schools since

Table 7

Results of Logistic Regression Analysis Predicting Lifetime and 30-day use of Cigarettes in AI/AN adolescents.

Dependent Variable	Predictor Variable	B	Wald Statistic	*p*-value	OR	95%CI
30-Day Use	Peer Influence					
	Friends use AOD	.187	106.32	<.001	1.206	[1.164, 1.249]
	Friends think AOD use is cool	.077	18.12	<.001	1.080	[1.043, 1.119]
	Family Influence					
	Family negative beliefs about AOD	.135	22.42	<.001	1.144	[1.082, 1.210]
	Parental monitoring	-.193	3.01	.083	.824	[.662, 1.025]
	Family has clear rules about AOD	-.046	0.431	.512	.955	[.831, 1.097]
	Religiosity					
	How often attends religious services	.068	1.44	.230	1.070	[.958, 1.196]
	Ease of Access to AOD					
	How easy to obtain AOD	.110	17.25	<.001	1.116	[1.060, 1.176]
	Nonparental (NP) Influences					
	NP negative beliefs about AOD use	-.496	3.85	.050	.609	[.371, .999]
	NP adult you're comfortable talking to	.134	1.04	.308	1.143	[.884, 1.478]
	NP adult notices good behavior	-.052	0.475	.491	.949	[.818, 1.101]
	School Belonging and Grades					
	Changed schools in the past year	.041	.086	.769	1.042	[.792, 1.372]
	Changed schools since kindergarten	.055	1.13	.287	1.057	[.995, 1.169]
	Grades last year	-.224	12.26	<.001	.800	[.706, .906]
	Grades better than other classmates	-.197	6.22	.013	.821	[.704, .959]
	Commitment to school	-.023	2.56	.109	.977	[.950, 1.005]

Note: B = the regression coefficient, or natural log of the odds ratio; OR = Odds Ratio.

Table 7 Cont'd.

Results of Logistic Regression Analysis Predicting Lifetime and 30-day use of Cigarettes in AI/AN adolescents.

Dependent Variable	Predictor Variable	B	Wald Statistic	*p*-value	OR	95%CI
Lifetime Use	Peer Influence					
	Friends use AOD	.201	210.38	<.001	1.223	[1.190, 1.257]
	Friends think AOD use is cool	.059	14.06	<.001	1.061	[1.029, 1.094]
	Family Influence					
	Family negative beliefs about AOD	.054	3.61	.057	1.055	[.998, 1.116]
	Parental monitoring	-.031	1.49	.221	.969	[.992, 1.019]
	Family has clear rules about AOD	.049	0.734	.392	1.050	[.939, 1.173]
	Religiosity					
	How often attends religious services	-.048	1.37	.241	.954	[.881, 1.032]
	Ease of Access to AOD					
	How easy to obtain AOD	-.177	117.03	<.001	1.193	[1.156, 1.232]
	Nonparental (NP) Influences					
	NP negative beliefs about AOD use	.002	.008	.930	1.002	[.958, 1.048]
	NP adult you're comfortable talking to	.109	1.41	.234	1.115	[.932, 1.335]
	NP adult notices good behavior	-.111	4.29	.040	.895	[.805, .995]
	School Belonging and Grades					
	Changed schools in the past year	-.042	.171	.680	.959	[.784, 1.172]
	Changed schools since kindergarten	.093	5.31	.021	1.097	[1.014, 1.188]
	Grades last year	-.231	20.40	<.001	.794	[.718, .877]
	Grades better than other classmates	-.185	10.02	.002	.831	[.741, .932]
	Commitment to school	-.033	9.22	.002	.968	[.947, .988]

Note: B = the regression coefficient, or natural log of the odds ratio; OR = Odds Ratio.

kindergarten, the odds of using cigarettes increased by 9.7% for lifetime use (*OR* = 1.097, 95% CI[1.014, 1.188]); current use was not influenced by the number of times an AI/AN teen changed schools since kindergarten. For every one-unit increase in grades the previous school year, the odds of using cigarettes decreased by 20.6% for lifetime use (*OR* = .794, 95%CI[.718, .877]) and 20% for current use (*OR* = .800, 95%CI[.706, .906]). For every one-unit increase in grades compared to classmates, the odds of using cigarettes decreased by 16.9% for lifetime use (*OR* = .831, 95%CI[.741, .932]) and 17.9% for current use (*OR* = .821, 95%CI[.704, .959]). Lastly, for every one-unit increase in commitment to school, the odds of using cigarettes decreased by 3.2% for lifetime use (*OR* = .968, 95%CI[.947, .988]); current use was not influenced by the level of commitment to school.

Alcohol

Results of the logistic regression analyses indicated that multiple protective and risk factors were statistically significant predictors of alcohol use among AI/AN adolescents (Table 8). The analyses indicated that for every one-unit increase in peers that used AODs, the odds of using alcohol increased by 19.2% (*OR* = 1.192, 95% CI[1.157, 1.227]) for lifetime use and 19.2% for current use (*OR* = 1.192, 95%CI[1.160, 1.224]). For every one-unit increase in peers who think AOD use is cool, the odds of using alcohol increased by 6.5% for lifetime use (*OR* = 1.065, 95%CI[1.030, 1.102]) and 7.2% for current use (*OR* = 1.072, 95% CI[1.039, 1.106]). For every one-unit increase in familial negative beliefs about AOD use, the odds of using alcohol increased

Table 8

Results of Logistic Regression Analysis Predicting Lifetime and 30-day use of Alcohol in AI/AN adolescents.

Dependent Variable	Predictor Variable	B	Wald Statistic	*p*-value	OR	95%CI
30-Day Use	Peer Influence					
	Friends use AOD	.176	163.01	<.001	1.192	[1.160, 1.224]
	Friends think AOD use is cool	.070	19.21	<.001	1.072	[1.039, 1.106]
	Family Influence					
	Family negative beliefs about AOD	.183	42.82	<.001	1.201	[1.137, 1.268]
	Parental monitoring	-.099	13.49	<.001	.905	[.859, .955]
	Family has clear rules about AOD	-.004	.005	.943	.996	[.888, 1.116]
	Religiosity					
	How often attends religious services	.043	.918	.338	1.044	[.956, 1.140]
	Ease of Access to AOD					
	How easy to obtain AOD	.125	48.07	<.001	1.133	[1.094, 1.174]
	Nonparental (NP) Influences					
	NP negative beliefs about AOD use	.057	6.43	.011	1.059	[1.013, 1.107]
	NP adult you're comfortable talking to	.188	3.36	.067	1.207	[.987, 1.474]
	NP adult notices good behavior	-.069	1.31	.252	.933	[.830, 1.050]
	School Belonging and Grades					
	Changed schools in the past year	.073	.425	.514	1.075	[.864, 1.338]
	Changed schools since kindergarten	.033	.592	.442	1.033	[.951, 1.123]
	Grades last year	-.063	1.35	.245	.939	[.845, 1.044]
	Grades better than other classmates	.019	.087	.768	1.019	[.899, 1.155]
	Commitment to school	.055	22.90	<.001	1.057	[1.033, 1.081]

Note: B = the regression coefficient, or natural log of the odds ratio; OR = Odds Ratio.

Table 8 Cont'd.

Results of Logistic Regression Analysis Predicting Lifetime and 30-day use of Alcohol in AI/AN adolescents.

Dependent Variable	Predictor Variable	B	Wald Statistic	*p*-value	OR	95%CI
Lifetime Use	Peer Influence					
	Friends use AOD	.175	138.3	<.001	1.192	[1.157, 1.227]
	Friends think AOD use is cool	.070	19.21	<.001	1.072	[1.039, 1.106]
	Family Influence					
	Family negative beliefs about AOD	.196	30.92	<.001	1.217	[1.136, 1.304]
	Parental monitoring	-.057	4.98	.026	.944	[.898, .993]
	Family has clear rules about AOD	.020	.119	.730	1.021	[.910, 1.144]
	Religiosity					
	How often attends religious services	.010	.064	.800	1.010	[.932, 1.095]
	Ease of Access to AOD					
	How easy to obtain AOD	.149	80.43	<.001	1.160	[1.123, 1.199]
	Nonparental (NP) Influences					
	NP negative beliefs about AOD use	.021	.762	.383	1.020	[.974, 1.071]
	NP adult you're comfortable talking to	.171	3.47	.062	1.186	[.991, 1.420]
	NP adult notices good behavior	-.079	2.12	.145	.924	[.831, 1.028]
	School Belonging and Grades					
	Changed schools in the past year	.210	4.16	.041	1.233	[1.008, 1.508]
	Changed schools since kindergarten	.110	6.83	.009	1.116	[1.028, 1.212]
	Grades last year	-.020	.146	.702	.980	[.884, 1.086]
	Grades better than other classmates	-.025	.170	.680	.976	[.869, 1.096]
	Commitment to school	.033	9.00	.003	1.033	[1.011, 1.055]

Note: B = the regression coefficient, or natural log of the odds ratio; OR = Odds Ratio.

by 21.7% for lifetime use (*OR* = 1.217, 95%CI[1.136, 1.304]) and 20.1% for current use (*OR* = 1.201, 95%CI[1.137, 1.268]). For every one-unit increase in parental monitoring, the odds of using alcohol decreased by 5.6% for lifetime use (*OR* = .944, 95%CI[.898, .993]) and 9.5% for current use (*OR* = .905, 95%CI[.859, .955]).

For every one-unit increase in ease of access in obtaining AOD, the odds of using alcohol increased by 16% for lifetime use (*OR* = 1.160, 95%CI[1.123,1.199] and 13.3% for current use (*OR* = 1.133, 95% CI[1.094, 1.174]). For every one-unit increase in the nonparental negative beliefs about AOD use, the odds of using alcohol increased by 5.9% for current use (*OR* = 1.059, 95%CI[1.013, 1.107]); lifetime use was not influenced by nonparental negative beliefs. The odds of lifetime alcohol use were 23.3% greater for AI/AN teens who changed school in the past year (OR = 1.233, 95% CI[1.008, 1.508]), compared to those who had not changed schools in the past year; current use was not influenced by whether an AI/AN teen had changed schools in the past year. For every one-unit increase in the number of times an AI/AN teen changed schools since kindergarten, the odds of using alcohol increased by 11.6% for lifetime use (*OR* = 1.116, 95% CI[1.028, 1.212]); current use was not influenced by the number of times an AI/AN teen had changed schools since kindergarten. Lastly, for every one-unit increase in commitment to school, the odds of using alcohol increased by 3.3% for lifetime use (*OR* = 1.033, 95%CI[1.011, 1.055]) and 5.7% for current use (*OR* = 1.057, 95% CI[1.033, 1.081]).

CHAPTER 4

DISCUSSION

The goal of the current study was to understand the risk and protective factors for adolescent substance use in the AI/AN community. Substance use has long been shown to be a significant problem in the AI/AN community, yet there are very few empirical studies that seek to understand the specific factors that may increase or decrease the likelihood of an AI/AN teen engaging in substance use. In this study we specifically examined whether the same empirically validated risk and protective factors that apply to the general population also apply to the AI/AN community, if there are risk and protective factors that are unique to the AI/AN community, and lastly whether certain risk and protective factors predict different types of substance use (i.e., cigarettes smokeless tobacco, alcohol, marijuana, and inhalant use).

Peer Influences

The findings of this study are consistent with our hypothesis that negative peer influences are significant risk factors for substance use across all the substances we examined in this study. Peer influences, as defined by peer substance use and peers' beliefs that AOD use is cool, were found to be significant risk factors for AI/AN substance use across each substance we examined in this study. This indicates that previous studies finding peer influence to be a significant risk factor for substance use in the general population (Gerrard et al., 2008; Musher-Eizenman et al., 2003; Ramirez et al., 2012; Simons-Morton, 2007) are likely to be generalizable to the AI/AN community.

It is also important to note that both peer influences examined in this study were significant risk factors for both lifetime and current use of each substance, except for marijuana. Peer beliefs that AOD use is cool was not a significant risk factor for lifetime use of marijuana, which suggests that there may be a different mechanism through which peer beliefs influence AI/AN lifetime marijuana use. One possibility found in the general young adult population (ages 18-30) is that using marijuana to fit in with a particular group, as is implied by the question of how many friends think AOD use is cool, is not only an uncommon reason for why young adults use marijuana, but that endorsement of this reason also decreases as the young adult ages (Patrick et al., 2011). Although the majority of the respondents in this study were between the ages of 12 and 16, it is possible that participants' reasons for using marijuana may have followed this same trend over time, thus obscuring the effect.

Family Influence

The effects of family influence on AI/AN teen substance use were partially consistent with our hypotheses. Family influences, as defined by a family's negative beliefs about AOD, parental monitoring, and clear familial rules about AOD, were found to be inversely influential on AI/AN teen substance use. Specifically, we found that the more negative a family's beliefs were about AOD, the more likely an AI/AN teen was to engage in substance use. This raises the possibility that the inverse, positive familial beliefs about AOD use would be a protective factor against substance use, may be true as well. On the surface this may seem grossly antithetical to studies showing that familial permissive attitudes towards substance use increase the likelihood of adolescent

substance use initiation (Hawkins, 1993; Ryan et al., 2010). However, if viewed through the lens of the individuation developmental process it becomes possible for the opposing findings to be a valid explanation of the risk and protective factors posed by family influence. The individuation process involves the development of autonomy, identity formation, and intimacy, which are all related to family interactions and parenting behaviors that support its development (Allen, Hauser, Bell, & O'conner, 1994; Boykin-Mcelhaney & Allen, 2001). A disruption in this process, such as lack of parental support and acceptance, often results in an unhealthy separation and detachment from one's family (Bray, Adams, Getz, & Mcqueen, 2003; Ryan & Lynch, 1989), which could manifest itself in an adolescent's decision to rebel against familial beliefs in an effort to increase autonomy. As it relates to this study, this disrupted individuation process may explain why negative familial beliefs served to increase the risk that an AI/AN teen would engage in substance use across each substance examined.

A second familial factor, parental monitoring, was examined and the results were partially consistent with our hypothesis in that parental monitoring was found to be a protective factor against AI/AN teen marijuana, alcohol, and smokeless tobacco-use, but not for inhalant or cigarette use. This indicates that previous studies that found parental monitoring to be a significant protective factor against substance use in the general population are likely to be generalizable to AI/AN population for marijuana, alcohol, and smokeless tobacco use. One possible explanation for parental monitoring having little effect on inhalant use is the fact that there are several common household items (i.e., adhesives, aerosol sprays, food items) that can be used as inhalants that, without specific substance use education, would be difficult for a parent to monitor. Additionally,

inhalants, unlike the other substances examined in this study, do not have the illicit substance status or legally mandated age-restrictions for sale, making them easily accessible to all of the respondents in this survey.

In regard to cigarettes, one possible explanation for the lack of impact parental monitoring is the important cultural role tobacco plays in the AI/AN community. Historically, tobacco was used in ceremonial and religious practices, as well as in medicinal and healing rituals (Hodge, 1996). Hodge (1996) states that some of these ceremonial uses are still practiced today and that they range from only being held in the hand, to being smoked in a sacred pipe (though it just reaches the mouth and is exhaled before entering the lungs), to being mixed with other ceremonial herbs and inhaled into the lungs (Hodge, 1996). Another indicator of the cultural acceptance of tobacco use in the AI/AN community is the prevalence rate of cigarette use, which indicates that AI/AN populations smoke at a rate of 21.8%, the highest percentage of any racial/ethnic demographic group in the United States (Centers for Disease Control and Prevention, 2009). That being said, parental monitoring is only a measure of the involvement parents have in their children's everyday lives and may only impact those substances that are culturally unacceptable, therefore potentially excluding AI/AN teen cigarette use from the influence of parental monitoring.

Lastly, inconsistent with our hypothesis on family influences, was that explicit familial rules related to AOD use did not have any influence on any of the substances examined except current and lifetime marijuana use, in which case it was a protective factor. This is very surprising considering the large impact that family influences have been shown to have in the general population (Greydanus, 2005; Hawkins, 1993;

Lipperman-Kreda et al., 2009; Parker & Benson, 2004; Ryan et al., 2010) and in the current study. Equally surprising is its protective nature for only marijuana use. Parental monitoring and clear rules about AODs appear to be closely related, as parents who monitor their children's behavior likely have clear rules about said behavior. Our findings, however, suggest that though this assumption may be accurate, there may be little impact of having clear rules about AOD use on all substances except for marijuana. This also suggests that the mechanism through which AI/AN teens choose to engage in marijuana use is likely different than the other substances. One possible explanation for the protective nature of familial rules related to AOD use on marijuana, may lie in the fact that marijuana is the only substance examined in this study that has legal repercussions associated with its possession. That being said, AI/AN teens may have a greater incentive (i.e., avoiding juvenile detention and/or community service) to avoid using marijuana that increases the impact that familial rules about AOD use have on their decision to engage in using this substance.

Religiosity

The effects of religiosity on AI/AN teen substance use were partially consistent with our hypotheses. We hypothesized that religiosity would be a protective factor against all substance use and what we found was that this was only true for lifetime marijuana use. Additionally, we found that religiosity had no impact on any other substance examined except for inhalant use, in which case it proved to be a risk factor for current inhalant use. One possible explanation for these findings is the low level of religiosity in the AI/AN community in general. In a study that looked at two of the largest

AI/AN tribes in North America, they found that the majority of AI/AN individuals between the ages of 15 and 35 rated religious beliefs as not being very important (Garroutte et al., 2009). This suggests that our findings could be a reflection of the relative unimportance of religious activity in AI/AN adolescents. Additionally, this same study found that participation in cultural events/celebrations (i.e., powwows), which are often entrenched in spiritual and religious practices, are often followed by "49s," which are informal social gatherings that typically involve the use of alcohol and illicit drugs (Garroutte et al., 2009). As our measure did not specify a difference between cultural events and religious services, it is possible that this explains the fact that there was no relationship between religious service attendance and most substance use. Another factor that may explain why religious service attendance was a risk factor inhalant use is that inhalants are typically not viewed as "real" drugs; thus, teens that have heard religious messages against drug use may avoid illicit drugs and use inhalants instead.

Ease of Access

The findings of this study are consistent with our hypothesis that ease of access to AODs is a significant risk factor for substance use across all the substances we examined in this study. This indicates that previous studies finding accessibility to be a significant risk factor for substance use in the general population (Burrow-Sanchez, 2006; Gruenewald, Johnson, & Treno, 2002) are likely to be generalizable to the AI/AN population.

It is also important to note that ease of access to AOD was a significant risk factor for both lifetime and current use of each substance, except for current smokeless tobacco

and inhalant use. Ease of access had no influence on the current use of these two substances, which suggests that there may be other factors at play that inoculate the influence of accessibility. One possibility for these findings may be related to the cultural-acceptability and high prevalence rates of tobacco use (Hodge, 1996) and the similarly high prevalence rates of inhalant use in the adolescent AI/AN community. Given the cultural acceptance of tobacco use in the AI/AN community, accessibility to tobacco may have little or no bearing on teen substance use as it is probably readily available and not viewed as an illicit substance. As for inhalant use, these findings may be reflective of its high prevalence among adolescents in AI/AN communities (Wu et al., 2011). Additionally, as stated above, inhalants are often common household items that are universally accessible, and they do not carry any legally mandated age restrictions or consequences for having them in one's possession.

Nonparental Adult Influence

The effects of nonparental adult influence on AI/AN teen substance use were partially consistent with our hypotheses. Similar to the findings of family influences, we found that NP adult influences, as measured by NP negative beliefs about AOD use, having an NP adult with whom the AI/AN teen is comfortable talking to, and an NP adult who notices good behavior, were inversely related to AI/AN teen substance use. Specifically, the more negative a nonparental adult's beliefs were about AOD, the more likely an AI/AN teen was to engage in substance use. As mentioned above, it is possible that these unlikely findings are related to the individuation developmental process. That being said, this finding is very important to the overall understanding of teen substance

use in the AI/AN community as it indicates that nonparental adult influence is commensurate with familial influence, which is something that is unique to the AI/AN community and not seen in the general population.

It is important to note that, though NP negative beliefs about AOD were a risk factor for every substance examined, they did have a protective impact on current cigarette use. One possible reason for this is that cigarette use is highly prevalent in the AI/AN community, suggesting that many of individuals may hold positive beliefs about cigarette use. If this is the case, then, falling in line with the pattern of rebelling as a result of a disrupted individuation process, AI/AN teens may rebel against the common beliefs of NP adults toward cigarette smoking in the same way they respond to those in their family: by engaging in the opposite behavior and choosing not to engage in current cigarette use. Further research is needed to better understand the specific attitudes that individuals hold towards cigarette use as a way of increasing our understanding of AI/AN cigarette use over time.

Another notable finding involved the impact of the quality of the relationship between the teen and the NP adult, as measured by having an NP adult a teen is comfortable talking to and whether there is an NP adult who notices good behavior, on substance use. In this study we found that being comfortable talking to an NP adult had no impact on substance use. Additionally, receiving positive reinforcement from an NP adult was a risk factor for lifetime cigarette use and current inhalant use. This is surprising considering that the quality of adult-child relationships have been shown to be important in teen substance use in the AI/AN community (Rodgers & Fleming, 2003). One possible explanation for the relationship between lifetime cigarette use and receiving

positive reinforcement from an NP adults may once again be related to the cultural acceptance of tobacco use and the high prevalence rates of cigarette use in the AI/AN community (Centers for Disease Control and Prevention, 2009; Hodge, 1996). With this in mind, having a positive relationship with an NP adult will likely increase an AI/AN teen's engagement in culturally- and socially-acceptable substance use over time, as was likely shown in this study. In regards to inhalant use, these finding may be reflective of its of high prevalence in the adolescent AI/AN communities (Wu et al., 2011) and the likelihood that they will engage in its use whether they have a positive relationship with an NP adult or not. This indicates still indicates, however, that NP adults have a unique influence on teen substance use in the AI/AN community and further research is needed to better understand the role that NP adults play in teen substance use in the AI/AN community.

School Belonging

The effects of school belonging, as measured by relocation to a new school, academic performance in the previous year and compared with other classmates, and commitment to school, were partially consistent with our hypotheses. Having changed schools in the past year and having changed schools more frequently since kindergarten were found to risk factors for lifetime alcohol, marijuana, cigarette, and both current and lifetime inhalant use, as hypothesized. In contrast, changing schools in the past year was found to be a protective factor against current marijuana use. One possible explanation for this is that students who have changed schools in the past year may have lost their

previous peer group and have not yet had the time to establish a new peer group that may influence their substance use.

High academic performance was shown to be a protective factor against cigarette use, marijuana, and smokeless tobacco, but was shown to have no influence on alcohol and inhalant use. This is surprising as school commitment was also found to be a risk factor for alcohol and inhalant use. One explanation for this may lie in the attitudes towards alcohol and inhalant use in the AI/AN community. Given the high prevalence rates of alcohol and inhalant use in both the AI/AN community and the general population ("Inhalant Use Among Youths," 2002; Wu et al., 2011) as well as the social acceptance of adult alcohol use, it may be possible that engagement in underage drinking and inhalant use is not something that AI/AN teens identify as "drug-use" and is therefore an acceptable behavior for academically-successful AI/AN teens engage in. Another important factor in inhalant use is the poor understanding that most teens have of the harmful effects. As such, it may be a substance that AI/AN teens view as harmless, therefore increasing the likelihood that even a responsible teen with a high academic performance is lulled into the idea the engaging in its use is acceptable. Once again, further research is needed to understand the attitudes that the AI/AN population has towards specific substances.

Limitations

One limitation of this study is that all of the data were self-reports from the adolescent participants. Although there is empirical evidence that self-reported substance use has good reliability and validity (Needle, Mccubbin, Hamilton, Lorence, &

Hochhause, 1983; O'malley, Bachman, & Johnston, 1983) the relationship between the independent variables examined and AI/AN teen substance use may have been heightened due to method variance and within-subject bias. Additionally, the measures that assessed peer substance use may be a reflection of the respondents' perception of their peers' use rather than an accurate report of their actual use. This study was also cross-sectional in nature, which did not allow for the longitudinal assessment of substance use over time. This would have been particularly helpful in understanding the differences observed between current and lifetime use of the same substance in relation to the different independent variables examined. Another limitation was the vague nature of the religiosity measure. As this measure was created as a part of a larger survey targeted at assessing adolescents from every ethnic and cultural group living in the United States, it did not make the delineation between cultural events/celebrations and strictly religious/spiritual services that is particularly salient to the AI/AN population. Lastly, this study did not include a measure for understanding the important attitudes that individuals in the AI/AN community have towards specific substances.

Clinical Practice and Tribal Public Policy

Several important findings from this study that may have implications for both clinical practice and tribal public policy geared towards decreasing teen substance use in the AI/AN community. One important finding is the large impact that peer influences had on substance use. While this finding has been shown countless times in the general population, and has already been shown in the AI/AN community as well, it still serves as an important reminder that if prevention efforts are to be successful they should focus

on teaching teens how to manage peer influence. Specifically, clinical focus should be placed on educating AI/AN children and teens on how to select positive peer groups, how combat peer pressure, and how to navigate the process of individuation and identity formation. In this same vein, public policy makers in tribal communities may wish to consider creating after-school and community programs where these themes can be discussed and practiced in a setting with the very peer groups we hope to influence.

One of the most significant findings in this study is the important role that nonparental adults have in the AI/AN community. As hypothesized, they have more of an important influence on AI/AN adolescent substance use than they do in the general population. This suggests that clinical interventions geared towards decreasing substance use in this community should likely take a systems approach, which focuses on the micro-, macro-, and mezzo-systems at play rather than place the majority of the focus on the adolescent and his or her immediate family. This is also important for future public policies that seek to effectively prevent AI/AN teen substance use. Preventive measures should likely take a community-based approach, as AI/AN culture is one that is built on the important values of familial, tribal, and cultural connections.

Another finding with important implications on clinical practice was the direction the impact of family influence had on AI/AN teen substance use. By and large, our findings indicated that AI/AN teens were positively influenced by active parental monitoring rather than familial beliefs and rules related to AODs. In fact, negative familial beliefs about AODs had the opposite effect than hypothesized, and increased their risk for substance use on every substance examined. These findings are critical for clinical practice and point towards the importance of training parents on behavior

management, limit-setting skills, and the value of an authoritative parenting style. It may also be helpful to educate families on the developmental stages and discuss how to create a home-environment conducive to successful development and identity formation. Public policy makers should also consider mandating family psychotherapy sessions for teens that have been arrested for substance-related charges as an important area of influence that may have played a role in their decision to engage in substance use in the first place. To implement these practices, we need to ensure that clinicians are being trained to intervene in a culturally competent manner and are being given the appropriate knowledge and skills to work effectively within the AI/AN culture. Unfortunately, there are comparatively few clinicians with this skill set, and more effort should be placed on encouraging members of the AI/AN community to become trained clinicians. Recruitment should also focus on identifying AI/AN adolescents and young adults with an interest in social sciences so that they might conduct their own research. Their first-hand knowledge of the AI/AN culture would increase the likelihood that the research topic is relevant to the community and enhance the chances that the findings are disseminated and implemented within the community.

Lastly, there appears to be a lack of knowledge within the AI/AN community related to the negative consequences of engaging in substance use, particularly in regards to inhalant and alcohol use. It is unclear if this lack of knowledge is due to insufficient education or a cultural acceptance that outweighs, in terms of value, the negative health consequences of substance use. Either way, more effort should be placed on increasing awareness of the historically negative impact that substance use has, and continues to have, on the AI/AN community. This could be achieved by hosting talks at cultural

events such as health fairs and powwows and making it apart of the curriculum at reservation schools or those that have a high population of AI/AN students.

Future Research

Theorized risk and protective factors were associated with each substance examined in quite different ways, suggesting that risk in the AI/AN teen population may be substance- and attitude-dependent. That being said, future directions should include measures that assess AI/AN cultural attitudes towards specific substances and link them with intentions and use, sensitive measures of adolescent stressors, measures that identify what stage of development the adolescent is currently in, acculturation measures to determine how mainstream versus traditional their beliefs are, demographic information related to whether they live on a reservation or not, and a measure of their knowledge of the negative effects of the different substances examined. It would also be useful to have familial and nonparental adult reports on their attitudes towards substance use, family rules, and the other independent variables examined in this study. Inclusion of these different measures in future research will shed more light on some of the findings in this study and enhance the ability of clinicians and public policy makers to have an effective impact on substance use in the AI/AN community. Lastly, future substance abuse prevention research in this area should attempt to embed their study in the social, historical, and political context in which the origin of the AI/AN's community's difficulties lie. Ultimately, there are several, current and historical, external factors that have contributed to the substance abuse disparities in the AI/AN community and those

will need to be addressed if there is to be a chance to close this gap and decrease the likelihood that an AI/AN youth engages in substance use.

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