DISSERTATION

AMERICAN INDIAN ADOLESCENT METHAMPHETAMINE USE: AN EXAMINATION OF REGION/IDENTITY VARIATIONS AND THE IMPACT OF PROTECTIVE FACTORS

Submitted by

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ABSTRACT

AMERICAN INDIAN ADOLESCENT METHAMPHETAMINE USE: AN EXAMINATION OF REGION/IDENTITY VARIATIONS AND THE IMPACT OF PROTECTIVE FACTORS

Objective: Studies suggest that American Indians (AI) have high rates of methamphetamine use and indicate that AI youth have a significantly higher prevalence of past year methamphetamine use relative to non-Hispanic Whites. Methamphetamine use has been associated with an increased risk of morbidity and many adverse long-term effects. Minimal research explores region and identity differences with methamphetamine use and primarily focuses on risk-factors that lead to higher levels of use. The proposed study sought to identify protective factors that increase abstinence and reduce patterns of use among adolescent AIs by exploring the impact of parental monitoring, positive social/peer support, positive self-esteem, ethnic pride, and ethnic experience on age of initiation and past-year methamphetamine use. **Method:** This study is a secondary data analysis of survey data collected form an epidemiological research study with AI youth. The current study uses data collected from the Fall of 2015 through the Fall of 2019. Participants included 14,769 adolescents, grades 7-12th, from 103 different schools, across seven distinct regions of the contiguous United States. **Analysis Plan:** Since lifetime methamphetamine use was reported in only 3.7% of the data, past-year use was dichotomized to account for varying modeling effects and model convergence. Means, frequencies, and standard deviations were calculated for all variables as well as bivariate correlations. To model the protective factors, Structural Equation Modeling (SEM) was used which included testing for model fit and psychometrics of the protective factor scales. An Exploratory Factor Analysis

(EFA) and Confirmatory Factor Analysis (CFA) were completed to determine fit of the items for each protective factor, with invariance testing at the configural, metric, and scalar levels. Firth's Penalized Likelihood logistic regression and censored regressions were used to examine direct effects between the five protective factors (parental monitoring, positive peer/social influence, self-esteem, ethnic pride, and ethnic experience) and two methamphetamine use outcome variables (i.e., age of initiation and past-year use). **Results:** Key findings in this study were that males in middle school that identified as AI-multi-ethnic living in the Northeast region and males in high school that identified as AI-multi-ethnic living in the Southern Great Plains region endorsed significantly more methamphetamine use in the past year with an earlier age of initiation. Additionally, parental knowledge, positive peer/social influence, and internal self-esteem increased the likelihood for AI adolescents to have not initiated methamphetamine use. Lastly, parental knowledge, positive peer/social influence, internal and external self-esteem, and ethnic experience factors were significant in increasing the likelihood that AI adolescents did not engage in methamphetamine use in the past year. **Conclusions:** This study provides powerful recommendations for programs that target AI adolescent methamphetamine use to further prevent initiation and build resilience. It demonstrates the need to foster parental knowledge, positive peer/social influence, self-esteem, and ethnic experience as protective factors. Understanding these factors within the AI community that contribute to positive outcomes for adolescents can help further programs, schools, and communities as prevention strategies implore techniques to maximize effectiveness in reducing overall AI adolescent substance use. Further, these results have implications for future research on prevention of AI adolescent methamphetamine use.

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INTRODUCTION

Indigenous Communities

American Indians (AI) and Alaska Natives (AN) comprise a small but diverse division of the US population. In 2010, 2.9 million Americans identified solely as AI or AN, and another 2.3 million identified as both AI/AN and at least one other race. Overall, this group accounts for roughly 1.7% of the US population (US Department of Health and Human Services, 2010). Within this population, more than 560 AI/AN tribes and communities have been federally recognized, ranging from a few hundred, such as the Chemehuevi and Hopi tribes, to hundreds of thousands of members, such as the Cherokee and Navajo Nation (U.S. Department of Commerce, 2011; Whitesell et al., 2012). AI/ANs predominantly live in the South and West and reside in rural reservations or urban/suburban settings. Overall, research suggests that AI/AN populations tend to be younger, less educated, and more likely to be poor compared to other Americans (Whitesell et al., 2012). More specifically, the median age for AI/ANs was 32 compared to 36 for the US as a whole, 14% reported having obtained a Bachelor's degree compared to 27%, and the overall poverty rate was 24.6% compared to 13.1% (U.S. Department of Commerce, 2011).

Research over the past several decades suggests that when compared to other American ethnic and racial groups, AI/ANs consume alcohol, cannabis, and other drugs at a significantly higher rate than their non-AI peers (Beauvais et al., 2004, 2008; Beauvais and LaBoueff, 1985; Miller et al., 2012). When comparing rates of substance use between AI/AN and persons who identify as White, significant disparities can be seen. Research suggests that comparing AI/AN to Whites for persons aged 12 and older: 1) the rate of illicit drug use was 12.7%

compared to 9.2%, 2) the prevalence of tobacco use was 48.4% compared to 29.2% (which may be considered culturally appropriate), 3) the rate of heavy alcohol use was 8.5% compared to 7.6%, and 4) the overall rate of substance dependence or abuse was 21.8% compared to 8.7% (Miller et al., 2012; Substance Abuse and Mental Health Services Administration, 2013). Although only around one-third of AI/ANs live on designated reservations or tribal areas (Snipp, 2005), these findings are concerning due to the consistent substance use-related problems that many tribes experience, such as increased delinquency, more violent/criminal behavior, higher rates of academic failure, and suicidality (Millet et al., 2012; Stiffman et al. 2003; U.S. Census Bureau, 2007; U.S. Department of Health and Human Services, 2009; Welty, 2002). While drug use at significantly higher rates has been identified among AI/AN communities, the majority of substance use research has targeted alcohol, cannabis, and tobacco. A recent call to action by NIDA director Nora Volkow (2022) suggests that methamphetamine use among AI/AN communities is a critical next step for researchers to explore.

Methamphetamine – History and Impact

Methamphetamine, commonly known as “meth,” “speed,” “chalk,” “crystal,” “crank,” “crico,” “cri-cri,” and “glass,” has been part of the U.S. drug culture for more than 40 years (NIDA, 2006). According to the National Congress of American Indians [NCAI] (2006), there are actually over 435 commonly used street names for methamphetamines. Methamphetamine is a white, odorless, bitter-tasting crystalline powder that can be easily dissolved in liquid, such as water, alcohol, or coffee. It was developed from amphetamine and primarily used medically via a nasal decongestant or bronchial inhaler and prescribed for the treatment of ADHD and narcolepsy (Glover-Kerkvliet, 2009; NIDA, 2006). When developed illegally, it is commonly produced from decongestants that contain pseudoephedrine or ephedrine mixed with iodine

crystals, red phosphorous, battery acid, or anhydrous ammonia (Glover-Kerkvliet, 2009). This illegal mixture has become widely used and typically resembles glass chards or larger crystals and is extremely potent and pure (Dreisbach et al., 2006).

Methamphetamine is a highly addictive, neurotoxic psychostimulant that is often associated with severe health, legal, and environmental consequences (Coughlin et al., 2021; Degenhardt et al., 2017; Halkitis, 2009; Sexton et al., 2006). More specifically, methamphetamine use has been associated with an increased risk of morbidity (National Institute on Drug Abuse, 1998), and evidence suggests that methamphetamine use can produce acute physical problems such as hyperthermia, palpitations, chills, hyper motor activity, kidney failure, mental confusion, tremors, and dizziness (Brown, Wise, & Kiyatkin, 2003; Herman-Stahl, Krebs, Kroutil, & Heller, 2007; National Institute on Drug Abuse, 1998, 2002). Additionally, methamphetamine use can lead to a variety of physical and psychological consequences, such as cardiovascular problems, infectious diseases, and psychosis (Coughlin et al., 2021; Darke et al., 2008; Glasner-Edwards & Mooney, 2014; Kaye et al., 2007; McKetin et al., 2014; Shoptaw & Reback, 2007; Tyner & Fremouw, 2008). Research suggests that family members of those who use methamphetamine are at a higher risk of experiencing adverse trauma, such as child abuse, neglect, and removal from the family environment (Whiteford et al., 2013). Many adverse long-term effects of methamphetamine use during adolescence have also been identified, including depression, paranoia, aggression, anxiety, mood swings, financial problems, legal and work problems, other illicit substance use, and psychosis (Couhglin et al., 2021; Lucas, 1997; Tyner & Fremouw, 2008; Whiteford et al., 2013). When exploring broader outcomes, research has found that communities are at risk for experiencing significant social consequences of

methamphetamine use, including increased rates of infectious diseases (HIV, Hepatitis C, etc.), increased crime, and general violence (Barr et al., 2006; Farabee et al., 2002).

Recent surveys have found that methamphetamine has become increasingly available and more affordable, resulting in more potent forms (Palamar et al., 2020; U.S. Drug Enforcement Agency, 2018). Research suggests that AI/AN communities are particularly vulnerable to the harmful effects of increased methamphetamine availability due to their higher levels of use of other substances and community-level factors such as increased poverty rates and rural environments (Armstrong and Armstrong, 2013; Coughlin et al., 2021; Jones et al., 2020). Additionally, AI/ANs have one of the largest rates of past-year illegal drug use compared to any other racial or ethnic group, according to SAMHSA [Substance Abuse and Mental Health Services Administration] (2020). Specifically with methamphetamine, SAMHSA reported that in 2018, an estimated 2.4% of AI/ANs aged 12 and up reported using methamphetamine in the past year, while other racial or ethnic groups reported 0.2% to 1.8% (2020). Additionally, research has found that overdose deaths due to methamphetamine were highest among AI/ANs compared to other racial and ethnic groups (Coughlin et al., 2021; Han et al., 2021). Of the research that has been conducted on AI/AN methamphetamine use, adolescents appear to be the most vulnerable to higher rates.

Native Youth

Epidemiological research primarily focuses on AI substance use broadly, with studies predominantly focusing on alcohol and cannabis use. This research suggests that AI youth are more likely than youth in the general population to engage in the use and misuse of substances (Gilchrist et al., 1987; Moran & Bussey, 2007; Petoskey et al., 1998). AI youth have consistently reported substance use at higher national rates than their non-AI peers (Stanley et al., 2014). For

example, research comparing Native youth to all other ethnicities found that indigenous adolescents were five times more likely to report consuming five or more drinks in one session (Centers for Disease Control and Prevention, 2018). Further, they were nine times more likely to report smoking tobacco and five times more likely to report using cannabis (Beauvais, 1992; Center for Disease Control and Prevention, 2018). Research has also found that injecting drug rates are three times higher among Native youth compared to non-indigenous adolescents (Bryant et al., 2016; Center for Disease Control and Prevention, 2018). Research also suggests that AI youth initiate substance use at an earlier age and have been identified as a risk factor for substance-related disorders and associated problems in the future (Stanley & Swaim, 2015). These risks place AI youth at a heightened risk for developing substance use disorders and experiencing other substance-related problems later in life (Dawson et al., 2008; Griffin et al., 2010; Stanely et al., 2014).

There is very little published literature regarding the use and effects of methamphetamine on AI adolescents and their methamphetamine use patterns specifically. Of the existing literature, results suggest that AIs have the highest rates of methamphetamine use (Iritani, Hallfors, & Bauer, 2007; Oetting et al., 2000), with results from the National Longitudinal Survey of Adolescent Health indicating that AI youth had a significant higher prevalence of past year methamphetamine use relative to non-Hispanic Whites in the same region (Iritani et al., 2007). When compared to the general population in the U.S., AIs aged 12 years and older reported using methamphetamine in the past year approximately three times more (Dickerson et al., 2015). Additionally, AI adolescents living on or near reservations consistently report higher rates of use compared to similarly aged peers (Swaim & Stanley, 2018). This ethnic disparity is a

major public health concern due to the severity of negative consequences associated with methamphetamine use.

Regional and Identity Impact

Despite the high prevalence of methamphetamine use among AI adolescents in the U.S. (Iritani, Dion Hallfors & Bauer, 2007), limited research has explored the variation of adolescent methamphetamine use across regions and identities. There are more than 560 federally recognized tribes, and cultural/ethnic homogeneity is unlikely. However, in most studies of substance use, AIs have been treated as uniform groups, reflecting what cross-cultural researchers refer to as "ethnic gloss" (Asdigian et al., 2018; Miller et al., 2012). This occurs when findings are overgeneralized to ethnocultural groups and ignores ethnic and cultural differences often found among group members. Due to confidentiality considerations, it is unethical for researchers to present findings at the tribal and school levels, so researchers typically focus on geographic regions. Exploring how geographic diversity and identity factors influence adolescent AI methamphetamine use can provide information that can be applied to intervention and prevention methods for treatment (Cleveland et al., 2008).

While there is limited information regarding regional variations in AI adolescent substance use, studies comparing Northern Plains and Southwest Plains found that AIs 15–24 years old living in the Northern Plains had significantly greater past year drug use compared to those living in the Southwest Plains (Whitesell et al., 2007). When exploring national samples of adolescent substance use, there are many gender and grade differences that vary depending on the substance. For example, research has found that among AIs, males tend to have higher prevalence rates for using cannabis and methamphetamine, while alcohol use rates appear to have no difference (Centers for Disease Control and Prevention, 2006; Eaton et al., 2006;

Wallace et al., 2003). Additionally, lifetime and 30-day prevalence rates of substance use generally increase as the youth's grade increases (Beauvais et al., 2004; Johnston et al., 2005; Wallace et al., 2003). In general, research has found that teenage girls have been closing the gap with boys in terms of usage of cannabis, alcohol, and other drugs (SAMSHA, 2010), and for AI youth, it appears that the gap has closed or been exceeded (Miller et al., 2012).

Studies have also found specific differences in patterns of substance use based on identity differences. Spear et al. (2005) found that AI females in 7th grade had significantly greater lifetime alcohol use compared to their male counterparts. However, 8th and 10th-grade AI males reported higher 30-day use rates compared to their female peers, and yet the rates became equal by the 12th grade (Wallace et al., 2003). The same study found that 10th-grade AI males reported greater rates of lifetime and past 30-day cannabis use compared to their female counterparts; however, by the 12th-grade females reported higher rates than males (Spear et al., 2005; Wallace et al., 2003). Researchers have also found that cannabis use was similar for AI male and female adolescents living in the Northern Plains when exploring regional differences directly (Beauvais et al., 2002; Bates et al., 1997).

Intersectionality

This research highlights the importance of examining the intersections of the person. Until recently, research exploring intersectionality has primarily focused on single social identity models (Bowleg et al., 2003; Dancy & Jean-Marie, 2014). These models are inadequate in describing how people are members of multiple social groups/categories simultaneously, referred to as "intersectional identities" (Crenshaw, 1995 & 2013). This is problematic because it omits experiences that are related to the convergence of multiple identities that can have various positive and/or negative impacts on a person from various contexts (Ferguson, 2006; Jones,

2009). One proposed framework for examining intersectional identities in research is the Model of Multiple Dimensions of Identity (Jones & McEwen, 2000), which posits that multiple social identities intersect at the individual level and interact with varying contexts of a mix of opportunity, oppression, and privilege (Bowleg, 2013; McCall, 2005). This model describes how an individual's identity is not the additive sum of several social affiliations but instead is mutually interacting social identities that are concurrently influencing one another within varying contexts (Mereish & Bradford, 2014).

When exploring intersectionality, of central importance are systemic issues that arise from holding multiple identities. Evans (2022) argues that shared identity has a collective social structure that is dependent on the community and location, and that this is often overlooked when examining the impact of marginalized identities. For example, multiple tribes in the same region have likely experienced similar treatment and historical trauma, which was geographically based (Weaver & Heartz, 1999). While the geographic region in which one lives might not be an identity like sex or ethnicity (i.e., a biosocial characteristic of the person), it encompasses a shared experience of those living in one region comparative to those living in another region. Additionally, as discussed above, substance use varies by region which necessitates the inclusion of region in this study as part of a person's intersectionality (Beauvais et al., 2002; Bates et al., 1997; Spear et al., 2005; Wallace et al., 2003; Whitesell et al., 2007).

Exploring the intersections allows researchers to examine various combinations of social categories (e.g., gender, race, age, etc.). This can be used to expand research on substance use to identify disparities and highlight the experiences of individuals from multiple minority/majority intersections (Bowleg, 2013; Mereish & Bradford, 2014). The current study utilizes epidemiological research from the Our Youth Our Future (OYOF) with data collected from

2015-2019, which provides regional data that can assist in identifying regional and identity differences among AI adolescent methamphetamine use, which raises the question: Are there identifiable differences in methamphetamine use among the intersections of gender, race, grade, and region?

Historical Trauma Theory

Although there is increasing evidence documenting the heightened risk of methamphetamine use among AI youth, explanations for why this discrepancy exists are limited. When discussing disparities in substance use for a specific population, it is important to acknowledge any unique historical contexts that may influence a person's pattern of substance use. One commonly applied explanation for higher rates and earlier initiation of substance use among AI adolescents is the Historical Trauma Theory (McLeigh, 2010; Sotero, 2006). This theory posits that a collective trauma or traumas experienced by a group of people is passed down from generation to generation through collective memories. The trauma(s) typically contains overwhelming psychical and psychological violence, segregation and/or displacement, economic deprivation, and cultural dispossession (Hirschberger, 2018; Sotero, 2006). When applied to AI communities, three major traumas have been explored: colonization, residential education, and forced assimilation (McLeigh, 2010; Sotero, 2006).

Increased substance use can be a common response to historical trauma as a way of "self-medicating" to avoid traumatic memories and to reduce emotional pain (Brave Heart, 2003). For example, within AI communities, policies that led to their peoples' loss of control over their land, culture, and way of life were associated with a response of internalized aggression and substance use (Brave Heart & Debruyn, 1998; Sotero, 2006). Exposure to these traumas often occurs unseen, as in many residential schools, children are not allowed to speak their language or

engage in their cultural traditions (Milloy, 1999; Nutton & Fast, 2015). This leads to increased substance use and can be a significant risk factor for minority populations who have experienced historical trauma (Brave Heart, 2003). While Historical Trauma Theory addresses cultural differences and experiences, other theories explore the immediate environment and experiences that influence substance use.

Jessor's Problem Behavior Theory

Problem Behavior Theory, introduced by Jessor in 1987, offers an insightful perspective on the prevalence of substance use among adolescents. This theory suggests that human behavior stems from the dynamic interplay between individuals and their surroundings (Jessor, 1987). It is comprised of three key systems: the perceived-environment system, the personality system, and the behavior system. The perceived-environment system focuses on how adolescents perceive themselves in their surroundings. Proximal factors (such as peer behavior modeling substance use) directly influence negative behaviors, while distal factors (such as parental support) also play a role. Additionally, the personality system encompasses enduring socio-cognitive elements like values, beliefs, and attitudes that are shaped by social learning and developmental experiences (Jessor, 1991). Lastly, the behavior system encompasses both problem and conventional behaviors. Problem behaviors include delinquency and norm-breaking acts, while conventional behaviors are socially sanctioned activities like religious engagement and academic achievement (Jessor, 2001).

By integrating these systems, Problem Behavior Theory provides a comprehensive understanding of adolescent substance use and misconduct. Research indicates its efficacy in explaining changes in adolescents' behaviors within a social-psychological framework (Jessor, 2001; Monahan et al., 2014). Moreover, the theory posits that adolescents predisposed to one

problem behavior, like delinquency, are prone to others, such as substance use. According to Problem Behavior Theory, adolescents are at heightened risk of substance use if they experience social criticism, cultural alienation, low self-esteem, and a perception of minimal risk associated with deviant behaviors. Additionally, a strong valuation of peer relationships contributes to this risk (Donovan et al., 1991; Donovan, Holtz & Appel, 2011; Jessor et al., 1995; Ko et al., 2008; Madkour et al., 2010).

While Historical Trauma Theory and Problem Behavior Theory can be difficult to explain specific disparities in substance use for AI communities directly, it provides a possible explanation for why these disparities exist to begin with. It also provides evidence as to where research efforts for intervention and prevention should focus to deter the effects of historical trauma, such as increasing resiliency and protective factors within this context (Jessor, 2001; McLeigh, 2010; Ungar, 2021). Historical Trauma Theory addresses cultural differences, experiences, and trauma that influence the immediate environment and experiences that influence AI substance use, while Problem Behavior Theory addresses how the environment can be modified to impact behavior. It is then important to identify a theory that explores a multisystemic approach to promoting resiliency in the face of adversities and incorporates these interactions with the environment.

Ungar's Multisystemic Approach

Resilience is the ability to effectively process or manage significant sources of stress, trauma, or deficits (Ungar et al., 2021). Ungar (2021) proposed a multisystemic approach to building resilience where individuals who have experienced adversity have the capacity and ability to adapt across the course of their lives. This model discusses how resilience can be promoted on the individual level based on the qualities and characteristics of the person, as well

as access to resources needed to support mental health and wellbeing (Theron et al., 2022; Ungar & Theron, 2020). This approach recognizes that resilience is not solely an individual trait and is more accurately shaped by the broader social and environmental contexts in which individuals live. Ungar (2021) discusses how resilience is influenced by various ecological systems, such as individual, family, community, and cultural factors. Further, his research explores the cross-cultural aspects of resilience and how various cultural contexts contribute to shaping the resilience process (Ungar & Hadfield, 2019). Research also suggests that resilience is positively impacted by cultural and contextual factors that help individuals become better able to manage situations where stress is significant, such as environments with increased substance use (Theron et al., 2022).

Ungar (2021) identifies multiple systems for building resilience, including individual factors, family dynamics, community support, and societal factors. Individual resilience factors such as coping skills, emotional regulation, and self-esteem play a crucial role in resisting engagement in risky behaviors and substance use. Similarly, family relationships can significantly influence behaviors as a supportive family environment (characterized by open communication, emotional support, and healthy boundaries) can promote resilience and protect against adolescent substance use. According to Ungar (2021), communities also play a vital role in fostering resilience and preventing adolescent substance use. Specifically, he highlights having access to supportive social networks, community resources, and positive role models as enhancing an individual's resilience. Lastly, this approach discusses building efforts to increase societal factors such as cultural norms, socioeconomic status, access to resources, and one's environment to increase resilience further (Ungar et al., 2013; Ungar & Wall, 2021).

Ungar's multisystemic approach highlights the significance of context-specific preventions that promote strengths across various systems to promote resilience in individuals and communities. This is critical in creating context-specific preventions that can enhance resilience at individual and community levels based on their culture (Ungar, 2021). By focusing preventions on targeting these multiple systems and their interactions, preventions can be tailored to address the underlying determinants expected to increase adverse behaviors such as substance use. This model can also be used to promote resilience across various levels of influence for AI adolescents, as discussed above with Historical Trauma Theory and Problem Behavior Theory.

By using the foundation of Historical Trauma Theory combined with that of Ungar's Multisystemic Approach to Resilience and Problem Behavior Theory, factors that influence AI adolescent methamphetamine use can be explored. Specifically, these theories highlight the impact that cultural alienation, social criticism, familial support/systems, individual and societal factors, and perceived harm/safety have on substance use behaviors. While prior research on substance use among AI communities has largely focused on prevalence rates, negative health outcomes, and risk factors unique to AI communities, researchers have been called upon by AI communities to examine the protective factors and strengths that are associated with later initiation or abstinence of methamphetamine use among AI adolescents (McLeigh, 2010; SAMHSA, 2016; Volkow, 2022).

It is important to discuss the distinction between resilience and protective factors as they are related concepts. As discussed above, resilience refers to the overall ability to adapt and thrive despite experiencing adversity. Protective factors are specific variables/conditions that contribute to building resilience by reducing the impact of stressors and promoting positive

outcomes. Protective factors are an important mechanism through which resilience is developed and maintained, as they reduce the likelihood of negative outcomes and/or promote positive outcomes in the face of adversity for AI adolescents (Borowsky et al., 1999; Cummins et al., 1999; Hawkins et al., 2004; Jessor et al., 1998; LaFromboise et al., 2006).

Protective Factors

Much of the literature on AI substance use focuses on risk factors that lead to harmful use and targets treatment/intervention of problematic behaviors. In contrast, positive psychology researchers have become interested in exploring the positive aspects of human behavior rather than the negative aspects (Donaldson et al., 2015). A primary goal for this area of literature is that by studying positive, more beneficial behaviors, researchers can better understand the processes that can be applied to those not living optimally functional lives.

There is a lack of research on protective factors for adolescent AI methamphetamine use. In the research that does exist, adolescents who reported low family conflict and high familial and social support were less likely than their counterparts to use methamphetamines (Herman-Stahl, 2006). Additionally, Reilly and colleagues found that family attachment and bonding, prosocial involvement in schools, interactions with prosocial peers, and opportunities for prosocial involvement within the community were significant protective factors for adolescent methamphetamine use (Reilly et al., 2020). Lastly, adolescents who reported high cultural identity, increased ethnic experiences, and limited use of other substances were less likely to use methamphetamines than those who did not report these attitudes/behaviors (Conant, 2020; Reilly et al., 2020; Rodriquez et al., 2005).

Multiple protective factors can foster healthy behaviors even when risk factors and adversity are present (Borowsky et al., 1999; Cummins et al., 1999; Hawkins et al., 2004; Jessor

et al., 1998; LaFromboise et al., 2006). Identifying these varying protective factors at the individual, relationship, and community levels and the impact that they have on AI adolescent methamphetamine use will address Volkow's (2022) call to action and provide critical information for preventative care (Cummins et al., 1999; LaFromboise et al., 2006; Mmari et al., 2010).

Parental Monitoring

While AI communities differ based on tribe and region, as discussed above, they commonly place high value on family and community relationships (Henson et al., 2017; Red Horse, 1997; Swaim & Stanley, 2021). More specifically, research has found that familial relationships for AI adolescents are directly effective at protecting against harmful behaviors such as substance use (Henson et al., 2017; Tingey et al., 2016). Research has also found that higher levels of parental monitoring was associated with higher likelihood of AI youth not using cannabis (Swaim & Stanely, 2021) and that higher levels of parental monitoring was associated with less frequency and likelihood of cannabis use in the past 30-days for AI youth (Haruyama et al., 2023). Additionally, studies have found parental monitoring and family connectedness to be a key protective factor for AI adolescents (Donohew et al., 1999; Galliher et al., 2007; Haruyama et al., 2023; Henson et al., 2017). Allen and colleagues (2006) also found that having a close relationship with their parents, receiving parental guidance routinely, and receiving varying praise and affection from parents are protective against adolescent alcohol use. A meta-analysis conducted on the varying protective factors for AI adolescents on health outcomes identified that the most powerful protective factor for adolescent mental health and reduce substance abuse/dependence was the youths' perceived family caring and positive family relationships (Cummins et al., 1999; Henson et al., 2017; Yu & Stiffman, 2010).

When exploring the influence of parental monitoring, it is important to identify contexts that may be unique to AI communities. The literature describes that AI communities are unique in their approach to family systems, as adolescents typically become more involved with the family unit as they age. This is different from traditional Western families, where adolescents typically become more independent with age (Red Horse, 1997). Additionally, when exploring differences specifically in substance use, AI families tend to focus on modeling and encouraging prosocial behaviors instead of punishing antisocial behaviors (i.e., use), which is contrary to traditional Western families (Halkitis, 2009; Red Horse, 1997; Sutton & Broken Nose, 1996). This difference in disciplinary style and views of the family unit could explain why research has consistently found support for the family factors in being highly effective for AI adolescent substance use (Boyd-Ball et al., 2014; Guo et al., 2021; Henson et al., 2017; Pu et al., 2013).

Peer/Social Influence

One of the most consistent findings in research is that peer influences play a pivotal role in the onset of adolescent substance use (Griffin & Botvin, 2010). Peers can strongly encourage experimentation and initial use and even contribute to heavier usage patterns. Exposure to positive attitudes towards substance use, coupled with the modeling of such behaviors by significant individuals like parents, siblings, and peers, exerts a significant negative influence on a young person's perception of their environment Griffin & Botvin, 2010; Mayberry et al., 2009). Additionally, social competence and peer substance use play crucial roles in shaping adolescent behavior, leading to increased substance use. While peer pressure has been linked to higher levels of substance use among adolescents, social competence acts as a protective factor (Wills et al., 1992). Adolescents with higher levels of social competence tend to employ effective strategies to resist peer pressure, reducing the likelihood of succumbing to substance-

related behaviors. This fosters personal characteristics that prioritize positive behaviors (Scheier & Botvin, 1998).

Research has found that peer influence is commonly a robust predictor of adolescent substance use generally for all populations (Beauvais, 1985; Iannotti et al., 1996; Mason et al., 2017; Monahan et al., 2014; Oetting et al., 2000; Wills et al., 1999), and directly impacts AI adolescents' lifetime and past month substance use (Henson et al., 2017; Momper et al., 2011; Tingey et al., 2016; Whitesell et al., 2014). Research has also found that connectedness to others who are not family members is a protective factor for AI adolescents (Hensen et al., 2017). Furthermore, studies have found that nonfamilial caring adults (such as school officials, religious leaders, and tribal leaders) were a protective factor against negative mental health consequences and initiation of substance use for AI adolescents (Barney, 2001; Pharris et al., 1997). LaFromboise and colleagues (2006) also found that feeling supported by peers within the community contributed to adolescents' ability to cope with adversity and resiliency. This research demonstrates the importance that social support and peer relationships with people who help to strengthen cultural identity are key protective factors against AI adolescent substance use.

Positive Self-Esteem

Self-image and self-efficacy have been identified as a protective factor for AI adolescent substance use (Henson et al., 2017). More specifically, research has found that believing in one's value and potential, feeling able to avoid violence and adverse situations, and feeling able to handle problems as they arise protects against the initiation of substance use and patterns of use (Allen et al., 2006; Cummins et al., 1999; Mackin et al., 2012; Pu et al., 2013; Whitbeck et al., 2001). Research also indicates that individuals who demonstrate assertiveness, social confidence, and effective communication are less inclined to partake in substance use alongside their peers

(Griffin & Botvin, 2010). Conversely, teenagers lacking in these competencies are more prone to substance misuse because they perceive/prioritize social advantages such as expanding their network, gaining popularity, and appearing more mature (Allen et al., 2006; Griffin & Botvin, 2010; Whitbeck et al., 2001). This suggests that youths with stronger social skills are more inclined towards positive behaviors, as they are less likely to engage in negative actions simply to fit in with a group. Swaim and Stanley (2019) examined the impact of self-esteem and cultural identification on substance use for AI youth directly and found that higher levels of self-esteem were associated with higher levels of cannabis use for female students in high school. They discussed how these findings contradict much of the previous literature on self-esteem, and encouraged future research to capture specific components of self-esteem and explore how it relates to specific substances for AI youth, including methamphetamine (Swaim & Stanley, 2019).

Ethnic Pride

Ethnic pride for AI adolescents is increased by being involved in traditional activities, identifying with AI culture, and being involved in and understanding the importance of traditional spirituality (Henson et al., 2017). Additionally, having a strong identity, pride, and connection to culture were found to reduce and prevent methamphetamine use for adolescent AI youth significantly (Reilly et al., 2020). Having a high sense of cultural connectedness increases the education of cultural expectations and values and has been found to be a protective factor against adolescent substance use and abuse (Allen et al., 2006). A study conducted by Barlow et al. (2010) found that adolescents who endorsed the importance of having strong traditional Indian values were less likely to use methamphetamines and other substances. This study also found strong cultural identification to be protective against substance use among other

populations in addition to AI communities (Barlow et al., 2010; Castro et al., 2007; Szlemko et al., 2006). These studies demonstrate how increasing AI adolescents' pride in their culture through traditions and heritage is a key protective factor because the interactions gained help develop cultural knowledge and strength and increase cultural identity/pride (Forcehimes et al., 2011). This research suggests that engagement in unique traditional cultural practices and beliefs that promote ethnic pride has the potential to strengthen the prevention of substance use initiation and patterns of use.

Ethnic Experience

Research has identified ethnic experience as a protective factor at the individual, relationship, and community levels (Allen et al., 2006; LaFromboise et al., 2006; Mmari et al., 2010; Pharris et al., 1997; Pu et al., 2013; Whitbeck et al., 2001). Positive opportunities within the community and positive social norms have been identified as protective factors for AI adolescent substance use (Henson et al., 2017). Positive opportunities in the community refer to appropriate or favorable times/occasions where adolescents can engage with their ethnic community through prosocial activity, such as culturally related rituals, extracurricular activities, and communal events. Positive social norms refer to rules of behavior that inform ethnic group members how to interpret a given situation, how to feel about it, and how to behave, all the while promoting a positive outcome (i.e., valuing adolescents as special members of the ethnic community, providing engaging activities and interactions, using age-appropriate discipline). Research has identified that having availability to extracurricular activities and participating in a sports team and/or clubs protect against substance use and contribute to increased academic success (Moilanen et al., 2014; Whitbeck et al., 2001). More specifically, Osilla and colleagues (2007) found that engaging in a sports team and participating in musical groups significantly

protect against tobacco use for adolescent AIs and increase engagement with their ethnic group. Additionally, research has found that allowing AI adolescents to contribute to the community via prosocial activities encourages attachment to that ethnic community and protects against alcohol use and abuse (Allen et al., 2006). Studies have also found that AI youth who report having positive prosocial behavioral norms (i.e., adolescents' perception of adult peers' approval or disapproval of substance use within their ethnic group) are less likely to engage in the initiation of substance use (Pettingell et al., 2008). Lastly, Allen et al. (2006) found positive adult role models that model sobriety in their ethnic community to be a significant protective factor against alcohol use and abuse for adolescents.

Current Study

Adolescent methamphetamine use arises from a variety of factors and has become prominent among AI communities, as discussed above. While most research has focused on AI substance use broadly or alcohol/cannabis use, little research explores the epidemiology and etiology of methamphetamine use directly. Research suggests that there are significant differences in patterns of substance use based on the region of the school that the youth attend and varying identity/demographic factors (sex and grade). It is important to examine these intersections to have a better understanding of increased risk. Understanding the significant variations in patterns of methamphetamine use by region and intersections of identities is needed, as little is known about the epidemiology of AI adolescent methamphetamine use. This study will utilize a data-driven approach to characterize the nuance in intersectionality and to identify which intersections are associated with the greatest methamphetamine use.

Research typically focuses on the risk factors associated with increased substance use for AI youth and rarely identifies positive factors that prevent use and increase optimal behavior. As

discussed above, protective factors can foster healthy behaviors even when risk factors and adversity are present (Borowsky et al., 1999; Cummins et al., 1999; Hawkins et al., 2004; Jessor et al., 1998; LaFromboise et al., 2006). Research has established parental monitoring, peer/social influence, positive self-esteem, ethnic pride, and ethnic experience as important protective factors that positively influence AI adolescents' decision to engage in unwanted/delinquent behavior. These protective factors have been found to reduce the initiation and frequency of substance use among adolescents when they report higher levels of the factors (Allen et al., 2006; Cummins et al., 1999; Henson et al., 2017; LaFromboise et al., 2006; Mackin et al., 2012; Mmari et al., 2010; Moilanen et al., 2014; Oetting et al., 2000; Pharris et al., 1997; Pu et al., 2013; Whitbeck et al., 2001). This suggests that as AI adolescents' report of protective factors increases, they are less likely to engage in harmful substance use.

This study seeks to identify protective factors that increase abstinence and reduce patterns of methamphetamine use among adolescent AIs through two primary aims:

> ***Aim 1:*** Explore differences across regions (geographic) and identities of AI adolescents for initial age of use and past year methamphetamine use. More specifically, this study will implement a data driven approach to characterize the nuance in intersectionality, and to identify which intersections are associated with the greatest methamphetamine use.
>
> ***Aim 2:*** Model the effect of various protective factors on the initiation of methamphetamines and methamphetamine use likelihood in the past year. Models will explore each predictor independently. More specifically, this will consist of ten models that contain the five protective factors (parental monitoring, peer/social influence, positive self-esteem, ethnic pride, and ethnic experience) regressed on the two methamphetamine outcomes (age of initiation and past-year use) individually.

Hypotheses will explore a negative association between protective factors and past-year methamphetamine use and a positive association between protective factors and age of initiation.

This study is novel in its exploration of intersectional differences for initial age and likelihood of initiation and methamphetamine use in the past year and for its focus on protective factors that affect methamphetamine use among AI adolescents.

Hypotheses

Epidemiology Aim – Characterize Descriptive Statistics:

Aim one is designed to characterize methamphetamine use (i.e., in the past year and age of initiation) across regions and identities for AI adolescents. While this study will focus on exploring the intersections associated with the greatest risk, some hypotheses can be made about the general patterns of methamphetamine use based on the research discussed above:

1. H1: A general pattern among intersections will show that those who identify as AI males will report greater methamphetamine use in the past year compared to AI females.
2. H2: A general pattern among intersections will show that AI adolescents in high school will report greater use of methamphetamine use in the past year compared to AI adolescents in middle school.
3. H3: A general pattern among intersections will show that those who identify as AI in the Northern Plains region will report greater use of methamphetamine use in the past year compared to AI in the Southwest Plains region.

Etiology Aim – Effects of Various Protective Factors:

4. H4: Those who report higher levels of parental monitoring will report a lower likelihood of methamphetamine use in the past year and report older ages of initiation.

5. H5: Those who report higher levels of positive peer/social influence will report a lower likelihood of methamphetamine use in the past year and report older ages of initiation.
6. H6: Those who report higher levels of positive self-esteem will report a lower likelihood of methamphetamine use in the past year and report older ages of initiation.
7. H7: Those who report higher levels of ethnic pride will report a lower likelihood of methamphetamine use in the past year and report older ages of initiation.
8. H8: Those who report higher levels of ethnic experience will report a lower likelihood of methamphetamine use in the past year and report older ages of initiation.

METHOD

Participants and Procedure

Secondary data analysis was completed for this study using survey data collected as part of an ongoing epidemiological and etiological research study with AI adolescents (grant number NIH/NIDA R01DA003371; M-PIs Swaim, Stanley, & Prince). Data collection for this research has occurred continuously since 1974, with the current cycle approved through 2025 (1993-2000, 2001-2006, 2009-2013, 2015-2020, and 2020-2025). The current study used data collected from the Fall of 2015 to the Fall of 2019, and participants were 7-12th grade students from 103 different schools. For each participating school, the appropriate tribal and school board approvals were obtained. All procedures were approved by the University Institutional Review Board at Colorado State University. Each school received a comprehensive report of their survey findings and compensation for resources used to complete the survey process, with median payment being $1,500.

The Our Youth, Our Future (OYOF) survey (Swaim & Stanley, 2018) was administered to students online via Qualtrics. During administration, school staff read directions to the students before they began the survey, informing them that they could decline to participate or leave any question blank if they preferred not to answer. The same instructions were administered for online surveys. To retain confidentiality and encourage students to answer honestly, staff were instructed to stand in an area of the surveying room where they could not see the students' responses/screens. Roughly three weeks before the scheduled survey, letters were sent to parents/guardians of the students in 7th – 12th grade that described the survey and provided instructions for opting their child out of the survey. Less than 1% of students were opted out of

this study by their parents or refused to take the survey when administered. All survey responses were collected anonymously, and all procedures were approved by the Colorado State University institutional review board. While the board approved the waiver of signed parental consent, both assent and consent were obtained from the parents and students.

Sampling Frame

The sampling frame for this study was developed from three primary sources: the National Center for Education Statistics Common Core of Data (CCD), the National Center for Education Statistics Private School Universe Survey (PPS), and the Bureau of Indian Education National Directory (BIE). Guidelines set by the American Association for Public Opinion Research (AAPOR) were followed for data collection and reporting. To be considered for inclusion in the sampling frame, only schools with students in 7^{th} – 12^{th} grade were considered that were located on or within 25 miles of a reservation or tribal lands. Additionally, a minimum of 20% of students enrolled had to identify as AI, with a total enrollment of at least 20 students in each grade.

The different regions for the sampling frame were identified by using regional distributions provided by the Bureau of Indian Affairs (BIA). This includes 12 regions identified by the BIA, accounting for factors such as geography, population, and cultures: Alaska, Eastern, Eastern Oklahoma, Great Plains, Midwest, Navajo, Northwest, Pacific, Rocky Mountain, South Plains, Southwest, and Western. Due to confidentiality, cultural distinctions, and number of potential schools in each region, schools were stratified into seven regions that were included in the final sampling frame: Northwest (includes northern California reservations), Northeast, Northern Plains, Southeast, Southern Great Plains, Southwest (includes Southern California reservations), and Upper Great Lakes.

Demographics

A total of 103 schools (32%) were identified within the seven regions and included in the final sample. Within the sampled schools, 14,769 students in grades 7^{th} –12^{th} participated, with 60.6% of those students self-identifying as AI (*n* = 8,950), 36.6% non-Hispanic White (*n* = 5,406), 18.7% Latino and/or Hispanic (*n* = 2,768), 9.0% Black or African American (*n* = 1,336), 2.1% Alaska Native (*n* = 305), 1.9% Asian American (*n* = 280), 1.5% Hawaiian or Pacific Islander (*n* = 226), and 9.7% self-identified as Other (*n* = 1,432). Approximately 47.4% of participants identified as AI only, and 52.6% reported another race or ethnicity in addition to AI (20.7% White; 10.6% Hispanic/Latino; 7.3% Black; 2.5% Alaska Native; 1.6% Hawaiian or Pacific Islander; 1.6% Asian American; 8.3% Other). Participants ranged in age from 10-18 years old (*M* = 14.63, *SD* = 1.80), where 49.5% identified as male and 49.1% identified as female (1.4% of participants chose not to answer). Further, 56.1% (*n* = 8,299) were in high school (grades 9-12), and 43.5% (*n* = 6,425) were in middle school (grades 7-8). See Table 1.

The regional distribution of participants was as follows: Northern Plains (NP): 15.6%; Northeast (NE): 2.7%; Northwest (NW) 4.5%; Southern Great Plains (SGP): 1.4%: Southeast (SE): 20.5%; Southwest (SW): 45.3%; Upper Great Lakes (UGL): 9.9%. As this study focused on characteristics of AI youth, only those that reported as AI, AI and one other ethnicity (AI-multi-ethnic), and non-Hispanic White (as the comparison group) were included in the analysis. A total of 14,356 adolescents were included in the analyses after subsetting the data.

To assist in interpreting results of Aim 1, variability among each grouping variable, i.e., ethnicity, sex, grade group, and region in methamphetamine use initiation was explored. The mean number of days using methamphetamine in the past year was also included, weighted by regional census data, to account for the sampling frame. Regional weights have no effect on the

means within a region, so the raw data was used to calculate the mean number of days. See Table 1. While there were some pairwise differences between groups, the focus of this study was on the intersections of the groups specifically. Thus, these differences were not reported as to not detract from the focus on intersectionality. Main effects results are available upon request from the author.

Table 1.
Intersecting variables (ethnicity, sex, grade group, and region) breakdown of methamphetamine initiation and weighted mean days used in the past year. Weighted mean is restricted to only those that reported using methamphetamine in the past year.

	No Meth Use Initiation n	Meth Use Initiation n (%)	Weighted Mean Days Used in Past Year
AI Only	5,751	134 (2.3%)	15.8
AI-Multi-Ethnic	2,803	84 (2.9%)	18.7
Non-Hispanic White	5,396	139 (2.5%)	19.1
Male	6,906	212 (3.0%)	18.0
Female	6,958	139 (2.0%)	17.4
Middle School	6,163	100 (1.6%)	17.5
High School	7,758	254 (3.2%)	17.9
Northeast	372	11 (2.9%)	24.1
Northern Plains	2,230	48 (2.1%)	13.6
Northwest	623	17 (2.7%)	27.7
Southeast	2,825	80 (2.8%)	26
Southern Great Plains	197	5 (2.5%)	23.8
Southwest	6,294	170 (2.6%)	16.9
Upper Great Lakes	1,409	26 (1.8%)	13.5

Measures

Methamphetamine Use Questions

Methamphetamine use was collected using the American Drug and Alcohol Survey (ADAS) version 7-9 (Beauvais & Swaim, 2013; Swaim & Stanley, 2020). The ADAS is a validated measure intended for use with minority populations and has been modified to focus on substance use for AI adolescents (Oetting & Beauvais, 1990). The ADAS assesses substance use, substance-use-related consequences, and peer influences on substance use. Questions on the ADAS are formatted as a table that asks about all substances, where participants respond to each individual substance below the initial question. See Appendix A for a complete version of the ADAS surveys administered. It is important to note that the language in the surveys for methamphetamine use differed: the Fall 2015 through Spring 2017 surveys listed "crystal meth (ice)," while the Fall 2017 through Fall 2019 surveys listed "methamphetamine (meth, crank, crystal meth, speed)." The version of surveys with the updated language will be used when providing examples of specific items/measures.

Age of methamphetamine use initiation was assessed through the following question: "At what age (if ever) did you FIRST do each of the following things? Don't count anything you took because a doctor told you to. Try methamphetamine (meth, crank, crystal meth, speed)." Response options listed each age in years, ranging from 7 (7 or younger) to 19 (19 or older). Students also had the option to choose "Never" (listed as 1 in the data).

The past year of methamphetamine use was assessed through the following question: "How many times (if any) have you taken METHAMPHETAMINE (meth, crank, crystal meth, speed) …DURING THE LAST 12 MONTHS?" Seven response options were provided: 0 times, 1-2 times, 3-5 times, 6-9 times, 10-19 times, 20-39 times, and 40 or more times. Since lifetime

methamphetamine use was reported in 3.4% of the 2015-2019 dataset, modeling effects could vary and impact model convergence. To account for the preponderance of zeros and rare events of methamphetamine use, past-year methamphetamine use was dichotomized.

Parental Monitoring

Parental monitoring was assessed using the Parental Monitoring Short Scale (Swaim & Stanley, 2022). This scale was adapted for use with reservation-based youth from established measures of parental knowledge, parental solicitation, and child disclosure. Swaim and Stanley (2022) explored a three-factor model measuring parental knowledge, parental control, and a combined factor for child disclosure and parental solicitation. Parental knowledge consisted of the following questions: 1) "My parents know where I am after school," 2) "When I go out at night, my parents know who I am with," and 3) "When I go out at night, my parents know where I am." Parental control consisted of 4) "When I go out on weekend nights, I have to be home by a set time," 5) "I have to tell my parents who I'm with and what I'm doing at night with friends," 6) "I have to tell my parents my plans for weekend nights," and 7) "I need permission to be out late on weeknights." Child disclosure and parental solicitation consisted of 8) "I tell my parents how I'm doing in school," 9) "I tell my parents about my activities with friends," 10) "My parents ask what I do in my free time," 11) "My parents ask about things that happen at school," and 12) "My parents talk to my friends." Response options range from 1 (Never) to 5 (Always), where higher scores indicate greater levels of parental monitoring. These factors have previously demonstrated good model fit (CFI = .97; RMSEA=.05; SRMR=.03), and invariance testing supported it to be appropriate for use across sexes (male versus female) and grade groups (middle school versus high school; Swaim & Stanley, 2022). Data for this scale was collected

from Spring 2016 – Fall 2019. Psychometric testing was completed to confirm this model within the dataset, which will be discussed further in the Results section.

Peer/Social Influence

Peer/social influence was assessed using adapted questions from the American Drug and Alcohol Survey (ADAS). This measure has been used in research to explore correlations of drug use among AI adolescents as part of the Our Youth Our Future Project conducted by the Tri-Ethnic Center for Prevention Research (Oetting et al., 1985; Oetting & Beauvais, 1990; Schick et al., 2020, 2021; Stanley et al., 2014; Stanley & Swaim, 2015, 2018; Swaim et al., 1997). While the ADAS measure has been used in large-scale epidemiologic literature, minimal research has explored the psychometric properties of the peer/social influence scales. Swaim and colleagues (1993) discussed four factors of peer/social influence on substance use for AI adolescents, consisting of peer substance use, peer offers to use, peer disapproval of use, and perceived peer pressure. Peer substance use consisted of the following questions: 1) "How many of your friends… Drink alcohol?" 2) "How many of your friends… Get drunk?" 3) "How many of your friends… Smoke cigarettes?" 4) "How many of your friends… Use marijuana?" and 5) "How many of your friends… Use other illegal drugs?" Peer offers to use was measured with the following questions: 6) "How often have your friends asked you to… Drink alcohol?" 7) "How often have your friends asked you to… Get drunk?" 8) "How often have your friends asked you to… Smoke cigarettes?" 9) "How often have your friends asked you to… Use marijuana?" and 10) "How often have your friends asked you to… Use other illegal drugs?" Peer disapproval of use consisted of the following questions: 11) "How much would your friends try to stop you from… Drinking alcohol?" 12) "How much would your friends try to stop you from… Getting drunk?" 13) "How much would your friends try to stop you from… Smoking cigarettes?" 14)

"How much would your friends try to stop you from… Using marijuana?" and 15) "How much would your friends try to stop you from… Using other illegal drugs?" Lastly, perceived peer pressure was measured with the following questions: 16) "How much pressure do you feel from your friends and schoolmates to… Drink alcohol?" 17) "How much pressure do you feel from your friends and schoolmates to… Get drunk?" 18) "How much pressure do you feel from your friends and schoolmates to… Smoke cigarettes?" 19) "How much pressure do you feel from your friends and schoolmates to… Use marijuana?" and 20) "How much pressure do you feel from your friends and schoolmates to… Use other illegal drugs?" Response options ranged from 1 (None/Not at all) to 4 (Most of them/A lot), where questions for peer substance use, peer offers to use, and perceived peer pressure are reverse coded so that higher scores indicate greater desired peer/social influence. Data for this scale was collected from Fall 2017 – Fall 2019. Psychometric testing will first explore the best-fitting model for these items and confirm this four-factor recommendation. Scoring for analyses depended on the outcome of psychometric testing and is discussed in the Results section.

Positive Self-Esteem

Haruyama and colleagues (2024) explored a multidimensional scale measuring self-esteem for adolescent cannabis use and proposed a two-factor model comprised of internal and external items. The adolescents' internal self-esteem was assessed through the following questions: 1) "I am proud of myself," 2) "I am able to do things well," 3) "I like myself," 4) "I am lucky," 5) I am smart," and 6) "I am good at games." External self-esteem was assessed through the following questions: 7) "Other people my age like me," 8) Other people my age like to be with me," 9) "People like me," and 10) "I am good looking." Response options ranged from 1 (Not at All) to 4 (A lot), with higher scores indicating greater self-esteem. Data for this

scale was collected from Spring 2016 – Spring 2018. Psychometric testing was completed to determine the best-fitting model for positive self-esteem, which will be discussed in the Results section.

Ethnic Pride

Adolescents' ethnic pride was assessed through questions created from the Multigroup Ethnic Identity Measure (Phinney, 1992) and adapted by the Tri-Ethnic Center, which had not yet undergone psychometric testing. Questions consisted of 1) "I am proud to be a member of my ethnic group," 2) "I try to find out more about the history and traditions of my ethnic group," 3) "I feel a strong attachment to my ethnic group," 4) "I have a lot of pride in my ethnic group," 5) "I feel good about my ethnicity," 6) "I am happy that I am a member of my ethnic group," 7) "My ethnic roots give me strength," and 8) My family does a lot to hold onto our ethnic identity and beliefs." Responses ranged from 1 (Strongly Disagree) to 4 (Strongly Agree), with higher scores indicating greater ethnic pride. Data for this scale was collected from Spring 2016 – Spring 2018. Scoring depended on the outcome of psychometric testing.

Ethnic Experience

Ethnic experience was assessed using items that were adapted from the Scale of Ethnic Experience (Malcarne et al., 2006), originally designed to measure multiple ethnic-related constructs across ethnic groups. The following items were used: 1) "Holidays related to my ethnicity are important to me," 2) "My ethnic group is respected," 3) "My ethnic group is treated well," 4) "Ethnicity is important to my parents," 5) "In groups, I feel most comfortable if most people there belong to my ethnic group," 6) "I feel like I belong to mainstream American culture," 7) "My ethnic group plays a big role in how I live my life," 8) "I don't think it's necessary to learn about the history of my ethnic group," 9) "Ethnic pride is not very important

to a child's upbringing," 10) "My ethnic group doesn't have the same opportunities as other ethnic groups," 11) "I have a strong sense of myself as a member of my ethnic group," 12) "I think friendships work best when people are from the same ethnic group," 13) "I think of myself as a typical American," 14) "It's easier to trust people from my own ethnic group," 15) "I often have to defend my ethnic group from criticism by other people," 16) "Discrimination against my ethnic group is not a problem," 17) "I want my close friends to be from my own ethnic group," 18) "My ethnic group is often criticized," 19) "I believe it's important to take part in holidays that celebrate my ethnic group," 20) "The opinions of people from my ethnic group are treated as less important than those of other ethnic groups," 21) "Ethnicity plays a very little part in my family life," 22) "I understand how to get along in mainstream American culture," 23) "I have been discriminated against because of my ethnicity," 24) "I take time to learn about the history of my ethnic group," 25) "The term "American" does not fit me," 26) "I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs," 27) "I believe my sense of ethnicity is strongly influenced by my parents," 28) "Being a member of my ethnic group is an important part of who I am," and 29) "My parents give me a strong sense of cultural values." Response options ranged from 1 (strongly disagree/not at all true) to 4 (strongly agree/very true), with higher scores indicating greater perceived ethnic experience. Items 8, 9, 16, 21, and 25 were reverse coded, per recommendation by Malcarne and team (2006). Data for this scale was collected from Fall 2018 – Fall 2019. Since some of these items were adapted from the original scale and used to measure AI ethnic experience, scoring depended on the outcome of psychometric testing.

Analysis Plan

Analyses used the 2015-2019 dataset and included middle and high school students, as research suggests that the average age of onset for methamphetamine use is 13.8 years old (Dickerson et al., 2012). Means, frequencies, and standard deviations were calculated for all variables, as well as bivariate correlations. Aim 1 included all participants that reported data on the two methamphetamine outcomes and each intersection (i.e., sex, grade, ethnicity, and region). Aim 2 was restricted to those who identified as AI or AI-multi-ethnic, and each protective factor was assessed independently. Data for the protective factors were collected on different years of the study and therefore resulted in a different number of participants for each model. Specifically, data for self-esteem and ethnic pride was collected from Spring 2016 – Spring 2018, peer/social influence was collected from Fall 2017 – Fall 2019, and parental monitoring and ethnic experience was collected from Fall 2018 – Fall 2019. The number of participants at each stage of analysis can be seen in Figure 1.

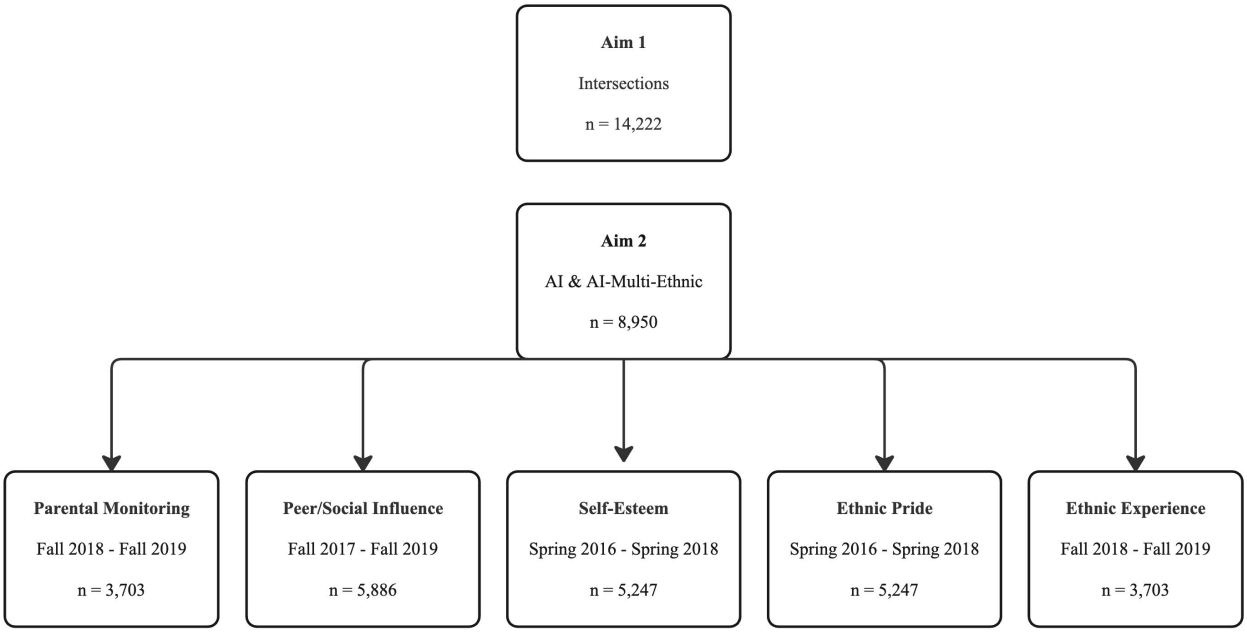

Figure 1.
Flowchart representing the number of participants (n) in each analysis. Aim 1 explored all participants that reported data on each intersecting group. Aim 2 restricted to AI and AI-Multi-Ethnic only, and each protective factor was collected at various years of the study resulting in different sample sizes.

Data Considerations for Nested Data

Descriptive statistics, including tests for assumptions of linearity, normality, and outliers for all variables, was completed. A key assumption that needed to be tested is the independence of observations. More specifically, the OYOF data is nested by design with the adolescents nested within schools, which conceptually violates the assumption of independence. In practice, some recommend an ICC less than 0.05 indicates that the violation does not bias the results (Croux et al., 2004). Because analyses were run in Mplus, a sandwich estimator to adjust the standard errors to account for this violation of independence was included in the censored models to adjust for the nested data. Firth Penalized Logistic Regression with latent variables were not available in Mplus so the sandwich estimator was not available. Instead, the estimator was included in creating the factor scores (discussed in more detail below) prior to exporting

them into R for the Firth Logistic models. It is important to note that in cases where this estimator was not needed due to low ICCs and included in the analysis anyway, it does not affect the results because no correction to the data would be made. This is discussed further in the Results section of the manuscript and can be seen in Table 2. Additionally, past-year methamphetamine use was dichotomized, as discussed above.

Aim 1: Descriptive Statistics

Aim 1 of this study sought to explore differences across regions (geographic) and demographics of AI adolescents for initial age of use and past year methamphetamine use. Demographics include sex (male, female), race/ethnicity (AI, AI-multi-ethnic, non-Hispanic White), and grade (middle school, high school). Relationships between the demographic characteristics were evaluated by calculating weighted means by the proportion of each intersection (i.e., with sex, ethnicity, grade, and region). First, for the age of initiation, a sampling distribution representing the proportions of ever-using methamphetamine and at what age was obtained using a cutoff of three standard deviations. Age of initiation estimates stratified by the intersections were used to calculate the weighted mean and CI of means by the proportion of each intersection. The weighted means of these proportions and CIs of proportions provided an indication of precision for those estimates that allowed for comparisons of intersections (Cumming, 2012). The same analyses were repeated, calculating the weighted means, standard deviations, and 95% confidence intervals (CI) for past-year methamphetamine use across each intersection. I used Z-scores to compare intersecting groups on the mean of methamphetamine use in the past year and age of initiation. This allowed for a comparison of each intersecting group to the sampling distribution mean (Andrade, 2021). A positive Z-score indicates that the data point is above the mean, while a negative Z-score indicates that it is below the mean. Z-

scores are also useful for identifying outliers in a dataset, where significance can be determined by three or more standard deviations from the weighted mean (Andrade, 2021; Colan, 2013; Curtis et al., 2016). See Figure 2.

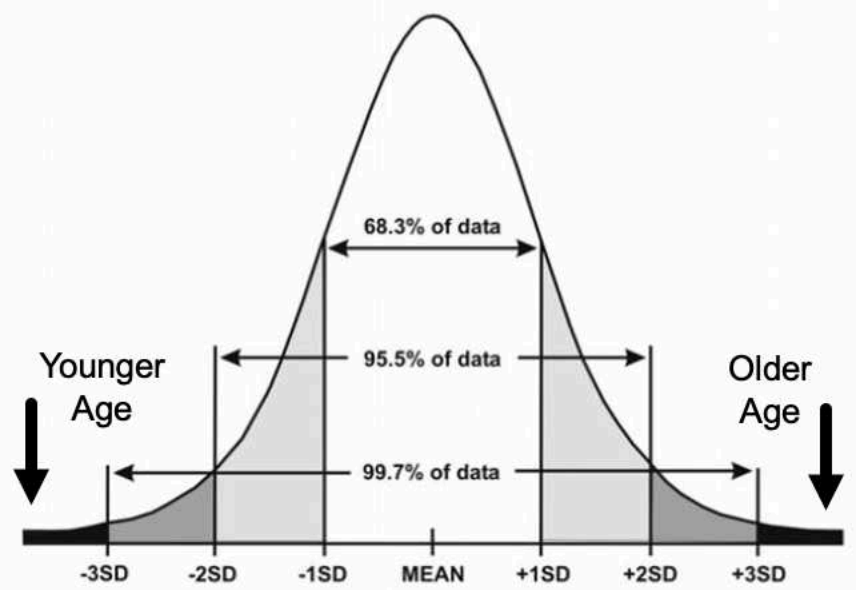

Figure 2.
The figure represents an example of the distribution of standard deviations to determine outliers of each intersection for the age of methamphetamine initiation (original image adapted from: https://stats.stackexchange.com/questions/476677/understanding-standard-deviation-in-normal-distribution).

Aim 2: Factor Analysis Procedures

The primary focus of the etiological goal (Aim 2) of this study was to identify the impact that protective factors unique to AI adolescents have on methamphetamine use. Since the protective factors being explored are unique to research on AI communities and established to better understand AI methamphetamine use specifically, the data will be restricted to only include those that identify as AI (this includes students who reported as AI and one other ethnicity, referred to as AI-multi-ethnic). This restriction is depicted in Figure 1. Although there may be differing outcomes by region, given how rare methamphetamine use is, it is not feasible

to control by region in this study. Instead, school-level variability was controlled for in each model, as discussed above.

Aim 2 of this study sought to model the effect of various protective factors on the initiation of methamphetamine and methamphetamine use patterns in the past year. To model the protective factors, exploratory factor analysis (EFA) was completed to determine the fit of items, followed by confirmatory factor analysis (CFA), which includes testing for model fit and psychometrics of the protective factor scales. After the best model fit was established, invariance testing on the configural, metric, and scalar levels was completed. Once the final measurement model was established, the final step was structural equation modeling (SEM), which was completed to test each measurement model for each protective factor variable separately. The criterion for each step will be discussed in detail below. Model fit was evaluated by using recommendations by Hu and Bentler (1999) for all EFA, CFA, and invariance models. This was not used for the censored regression models because they require multiple linear regression nor were they used for the Firth Penalized regression models because they were run in RStudio and do not have fit statistics. All these analyses were completed in Mplus Version 8.1 (Muthén & Muthén, 1998-2017).

For interpreting indices to assess for model fit, the root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis Index (TLI), and standardized root mean square residual (SRMSR) were used. Additionally, the Chi-Square test of model fit was used with a non-significant test indicating the perfect fit of the model to the data. The RMSEA analyzes differences between a hypothesized model and the population covariance matrix, where values below .06 are interpreted as a relatively good model fit (Hu & Bentler, 1999). The CFI tests if the hypothesized model is an improvement over a model of complete

independence, where values equal to or above .95 are indicative of excellent model fit (Hu & Bentler, 1999). The SRMR is calculated as an average of the residual correlations in the model and is typically interpreted with the RMSEA, which is especially important when modeling categorical and/or dichotomous data (Maydeu-Olivare & Joe, 2014). For the SRMR, values equal to or below .08 are suggestive of good model fit and were used to assess each model (Hu & Bentler, 1999). When assessing invariance models, Hu & Bentler's (1999) guidelines for CFI, RMSEA, and SRMR are commonly used in addition to chi-square difference tests. However, research suggests that chi-square tests can be sensitive to large sample sizes and recommend that in sample sizes over 300 additional indices should be used to evaluate model fit, including a CFI difference no larger than 0.01 and sample-adjusted Bayesian information criterion (SABIC) where a lower SABIC suggests the model is more parsimonious (Chen, 2007; Cheung & Rensvold, 2002).

When modeling new measures, psychometric testing starts with EFA (Brown & Moore, 2012). When EFA was conducted, eigenvalues, scree plots, and goodness of fit statistics were interpreted to determine the underlying factor structure (Brown, 2015). Typically, any factor with an eigenvalue less than one indicates that the factor does not explain adequate additional variance for the variable being modeled (Guttman, 1954; Kaiser, 1960). Additionally, since the scree plot plots the eigenvalues for all factors, additional factors were not retained in the analysis when the scree plot began to level off (DeVellis, 2012).

Since psychometric work had already been done using the current dataset on the scale of parental monitoring, the analysis started with an CFA. For all other protective factors proposed in this study (peer/social influence, positive self-esteem, ethnic pride, and ethnic experience), psychometric analyses started with a EFA to determine the fit of the items for each factor. After

determining adequate fit, invariance testing at the configural, metric, and scalar levels by sex and grade group was completed. Configural invariance indicates that the factor structure is the same, metric invariance indicates that the factor structure and factor loadings are the same, and scalar invariance indicates that the factor structure, loading, and item intercepts are the same. When scalar invariance is achieved, the grouping variable (grade group and sex) does not need to be controlled for.

Aim 2: Modeling the Predictive Effect of Protective Factors

To model aim 2 of the study, analyses explored the outcome variables related to methamphetamine use. Specifically, the main outcomes in this study were past-year methamphetamine use and age of initiation, which were tested using separate analyses. When analyzing rare events such as methamphetamine use, it is important to recognize the range of distributions as the data tends to be highly skewed due to a preponderance of zeros (Neal & Simons, 2007). Due to having zero-inflated counts in the data, past year methamphetamine use was dichotomized to youth who endorsed methamphetamine use versus not endorsed. When analyzing a dichotomized variable such as methamphetamine use, rare events and complete separation are common analytical challenges that influence the convergence of a logistic regression model. Complete separation arises when a covariate or variable consistently accompanies or never accompanies the variable of interest (the outcome variable) and tends to be more prevalent with rare events in the dataset, such as adolescent methamphetamine use (Karanon, 2020). In logistic regression analysis, maximum likelihood estimation is a common method. However, Allison (1990) notes that small-sample bias can influence the maximum likelihood estimation of logistic models, particularly when the study's sample size strongly hinges on the number of AI adolescents reporting methamphetamine use versus those reporting

no use. To address this issue, Firth (1993) proposed a solution within logistic regression known as Firth's Penalized Likelihood logistic regression model. This approach mitigates the impact of small-sample bias in maximum likelihood estimation and provides consistent estimates of regression parameters even when maximum likelihood estimates do not exist (Firth, 1993; Karanon, 2020; King & Zeng, 2001). Therefore, all models analyzing past-year methamphetamine use as the outcome variable used Firth's Penalized Likelihood logistic regression.

Firth's Penalized Likelihood stands as a prevalent strategy to alleviate the bias associated with rare events in data and reliably converges in instances of complete separation (Firth, 1993). This model yields penalized likelihood odds ratios and 95% confidence intervals. Odds ratios indicate the likelihood of an outcome occurring per one-unit increase in the predictor, where an odds ratio > 1 suggests higher odds of the outcome, an odds ratio < 1 implies lower odds, and an odds ratio = 1 indicates no discernible effect on the outcome. Interpretations of odds ratios herein adhere to the guidelines outlined by Szumilas (2010). Statically significant confidence intervals are those that exclude 1.

While Firth penalization helps to mitigate the bias of rare events in logistic regression models, convergence issues can still arise when the optimization algorithm struggles to find the optimal solution in the model. This can occur because Firth Penalized logistic regression introduces an additional term to the likelihood function to counteract bias and inefficiency, adding complexity to the model. Additionally, the statistical package used to calculate the Firth Penalized logistic regression (Heinze et al., 2023) is unable to handle latent variables and, therefore, cannot use factor scores as predictors. One solution to this is to export the factor scores for each individual on the latent variables (i.e., parental monitoring, peer/social influence, self-

esteem, ethnic pride, and ethnic experience) and use these scores in the logistic regression. A potential risk of this approach is that it is assigning participants a response that they did not actually give. Additionally, some argue that factor scores are frequently computed inaccurately, leading to significant non-zero intercorrelations among the outcomes (Glass & McGuire, 1996; Ng & Chan, 2020). An advantage of the approach of exporting latent factor scores is that the factor scores represent the separated true score from the error, reducing the influence of measurement error and allowing a more precise analysis and interpretation of the data. Moreover, the exported factor scores have another advantage in that the sandwich estimator correction was used in the creation of the factor scores for all variables except the outcome variable. Factor scores for each protective factor were exported from Mplus into R for each individual, allowing the direct effect for predicting the likelihood of use in the past year to be analyzed with the exported factor scores as predictors.

To model the outcome variable of age of initiation, the properties of the variable must be considered. Specifically, the outcome variable for age of methamphetamine use initiation was collected, with responses ranging from 7 years of age to 18 years of age, causing a ceiling effect. This ceiling effect occurred in the data because methamphetamine use is a rare event, and most individuals initiate use at a later age. To appropriately model the data with a ceiling effect, censored regression with responses being censored from above was used (Ehsan Saffari et al., 2012). Specifying the data as censored from above (indicating a later age of first initiation for methamphetamine use) allows the models to identify students who have not yet initiated methamphetamine use to a single value (e.g., the ceiling value; in this study this value is set to 19), while also allowing for a continuous distribution among the remaining responses for age of initiation (Ehsan Saffari et al., 2012; Hansen & Graham, 1991). This is an important step for

general linear models that are placed on a continuum as youth who did not endorse methamphetamine use were originally coded as 0 years old for age of initiation, indicating high risk. Changing this to the maximum value shifts the data so that there is a large stack of participants with an implied age of initiation at 19 for those who have not initiated instead of 0. Transforming youth who did not endorse methamphetamine use in this way allows a censored inflated model (from above) to be used instead of a zero inflated model. This censored from above approach also breaks the model into two parts, where the logistic portion of the regression is used to predict those who reported having initiated versus not initiated, and a normal portion of the regression that predicts the age of methamphetamine use initiation among those who reported having ever used. Using censored regressions when modeling rare events such as methamphetamine use has been shown to be an effective modeling approach (Ehsan Saffari et al., 2012; Hansen & Graham, 1991).

Statistical Software

To complete Aim 1 of this study and characterize descriptive statistics, analyses were conducted in RStudio version 2023.12.1 (RStudio Team, 2023) using packages sjPlot for graphing (Lüdecke, 2021) and dplyr, janitor, skimr, and tidyverse for data wrangling (Firke, 2021; Lüdecke, 2021; Waring et al., 2021; Wickham et al., 2019).

For Aim 2 of the study, all EFA and CFA were conducted using Mplus version 8.1 (Muthén & Muthén, 1998–2021). The censor-inflated regressions modeling the outcome of the age of initiation also used Mplus version 8.1. To conduct Firth's Penalized Likelihood logistic regression when modeling the dichotomized past-year methamphetamine use outcome, RStudio version 2023.12.1 (RStudio Team, 2023) using package logistf was used (Heinze et al., 2023; Huang, 2020; Kosmidis & Firth, 2020).

RESULTS

The results of this study are broken into three sections, first examining the descriptive statistics of the data. Then, hypotheses related to Aim 1 characterizing the intersections on likelihood of use in the last year and age of initiation are analyzed. Lastly, hypotheses for Aim 2 will be examined for each protective factor by first discussing the psychometrics of the model, then interpreting the two SEMs of each protective factor on the age of initiation and the likelihood of use in the past year. The intercepts for each protective factor will not be reported in regression analyses, as the intercept of the model provides the prevalence of methamphetamine use in the sample when the predictors equal 0, and this was explored in more depth for all intersections in Aim 1.

Descriptive Statistics

Each protective factor was obtained/adapted from specific scales, as discussed above in the methods section. Factors were first measured with an EFA and confirmed with a CFA. Invariance at the scalar level was found for each model, so the protective factors were used to model the study aims. Examination of each indicator variable indicated no violations of linearity, normality, or independence. There were items on the peer/social influence protective factor with ICCs greater than 0.05. These ICCs indicated that there was more between school invariability, with 5% between schools and the rest between students. In the context of peer/social influence, the culture of certain schools and/or communities could differentiate, which would impact peer substance use and peers offering to use. A sandwich estimator was particularly important to account for these higher ICCs and included in the models. Means, standard deviations, intraclass correlations (ICCs), and the percent of responses completed within the dataset for each item used

in the analysis are presented in Table 2. For consistency across protective factors, the items for peer/social influence were reversed so that higher scores represent increased protection against substance use. Methamphetamine use outcomes were non-normal, such that methamphetamine use in the past year was highly skewed and therefore dichotomized, and age of initiation was censored from above.

Table 2.
Means, standard deviations, ICCs, and percent of responses completed for indicator variables.

Note. SD = standard deviation; ICCs = intraclass correlations; *(R)* = Item was reverse coded; Parental Monitoring latent variable was on a 1 – 5 scale with higher scores indicating increased support; All other latent variables was on a 1 – 4 scale with higher scores indicating increased protection.

Item	Mean (SD)	ICC	% Complete
Parental Monitoring			
Parental Knowledge			
1. My parents know where I am after school.	4.39 (1.04)	0.020	93%
2. When I go out at night, my parents know who I am with.	4.26 (1.20)	0.020	93%
3. When I go out at night, my parents know where I am.	4.21 (1.21)	0.020	92%
Parental Control			
4. When I go out on weekend nights, I have to be home by a set time.	3.68 (1.46)	0.021	93%
5. I have to tell my parents who I'm with and what I'm doing at night with friends.	3.80 (1.42)	0.020	35%
6. I have to tell my parents my plans for weekend nights.	3.53 (1.51)	0.017	35%
7. I need permission to be out late on weeknights.	3.83 (1.46)	0.023	35%
Child Disclosure/Parental Solicitation			
8. I tell my parents how I'm doing in school.	3.65 (1.33)	0.027	35%
9. I tell my parents about my activities with friends.	3.49 (1.44)	0.018	35%
10. My parents ask what I do in my free time.	3.09 (1.49)	0.017	35%
11. My parents ask about things that happen at school.	3.59 (1.40)	0.022	35%
12. My parents talk to my friends.	3.17 (1.45)	0.022	35%
Peer/Social Influence			
Peer Substance Use			
13. How many of your friends… Drink alcohol? *(R)*	2.84 (1.10)	0.167	93%
14. How many of your friends… Get drunk? *(R)*	2.98 (1.09)	0.166	93%
15. How many of your friends… Smoke cigarettes? *(R)*	3.25 (0.97)	0.102	93%
16. How many of your friends… Use marijuana? *(R)*	2.72 (1.20)	0.153	93%

Item	Mean (SD)	ICC	% Complete
17. How many of your friends… Use other illegal drugs? *(R)*	3.53 (0.88)	0.044	93%
Peer Offers to Use			
18. How often have your friends asked you to… Drink alcohol? *(R)*	3.29 (0.98)	0.118	93%
19. How often have your friends asked you to… Get drunk? *(R)*	3.37 (0.96)	0.105	93%
20. How often have your friends asked you to… Smoke cigarettes? *(R)*	3.57 (0.82)	0.052	93%
21. How often have your friends asked you to… Use marijuana? *(R)*	3.07 (1.14)	0.119	93%
22. How often have your friends asked you to… Use other illegal drugs? *(R)*	3.73 (0.71)	0.018	93%
Peer Disapproval of Use			
23. How much would your friends try to stop you from… Drinking alcohol?	2.53 (1.23)	0.027	92%
24. How much would your friends try to stop you from… Getting drunk?	2.60 (1.25)	0.027	92%
25. How much would your friends try to stop you from… Smoking cigarettes?	2.67 (1.28)	0.024	92%
26. How much would your friends try to stop you from… Using marijuana?	2.47 (1.28)	0.046	92%
27. How much would your friends try to stop you from… Using other illegal drugs?	2.85 (1.32)	0.023	92%
Perceived Peer Pressure			
28. How much pressure do you feel from your friends and schoolmates to… Drink alcohol? *(R)*	3.49 (0.94)	0.028	92%
29. How much pressure do you feel from your friends and schoolmates to… Get drunk? *(R)*	3.50 (0.96)	0.029	92%
30. How much pressure do you feel from your friends and schoolmates to… Smoke cigarettes? *(R)*	3.55 (0.93)	0.034	92%
31. How much pressure do you feel from your friends and schoolmates to… Use marijuana? *(R)*	3.42 (1.01)	0.036	92%
32. How much pressure do you feel from your friends and schoolmates to… Use other illegal drugs? *(R)*	3.54 (0.98)	0.040	92%
Self-Esteem			
Self-Esteem Internal			
33. I am proud of myself.	3.20 (0.92)	0.031	93%
34. I am able to do things well.	3.23 (0.85)	0.015	93%
35. I like myself.	3.13 (1.02)	0.032	93%
36. I am lucky.	2.93 (1.02)	0.015	93%

Item	Mean (SD)	ICC	% Complete
37. I am smart.	3.01 (0.90)	0.027	92%
38. I am good at games.	3.10 (0.92)	0.015	92%
Self-Esteem External			
39. Other people my age like me.	2.99 (0.90)	0.028	93%
40. Other people my age like to be with me.	2.90 (0.94)	0.024	92%
41. People like me.	2.97 (0.92)	0.027	92%
42. I am good looking.	2.57 (1.07)	0.044	92%
Ethnic Pride			
Ethnic Pride			
43. I am proud to be a member of my ethnic group.	2.86 (1.09)	0.035	55%
44. I try to find out more about the history and traditions of my ethnic group.	2.65 (1.10)	0.037	55%
45. I feel a strong attachment to my ethnic group.	2.63 (1.10)	0.034	55%
46. I have a lot of pride in my ethnic group.	2.82 (1.11)	0.025	55%
47. I feel good about my ethnicity.	2.91 (1.06)	0.029	55%
48. I am happy that I am a member of my ethnic group.	2.90 (1.08)	0.029	55%
49. My ethnic roots give me strength.	2.75 (1.11)	0.032	55%
50. My family does a lot to hold onto our ethnic identity and beliefs.	2.70 (1.10)	0.037	55%
Ethnic Experience			
Ethnic Group Importance			
51. Holidays related to my ethnicity are important to me.	2.80 (0.98)	0.038	35%
52. My ethnic group is respected.	2.78 (0.94)	0.042	35%
53. My ethnic group is treated well.	2.75 (0.93)	0.042	35%
54. Ethnicity is important to my parents.	2.78 (0.98)	0.036	35%
55. In groups, I feel most comfortable if most people there belong to my ethnic group.	2.55 (0.98)	0.029	35%
56. I feel like I belong to mainstream American culture.	2.58 (0.96)	0.027	35%
57. My ethnic group plays a big role in how I live my life.	2.62 (1.02)	0.037	35%

Item	Mean (SD)	ICC	% Complete
Ethnic Affiliation			
58. I don't think it's necessary to learn about the history of my ethnic group. *(R)*	2.33 (0.93)	0.007	34%
59. Ethnic pride is not very important to a child's upbringing. *(R)*	2.41 (0.95)	0.005	34%
60. My ethnic group doesn't have the same opportunities as other ethnic groups.	2.65 (0.97)	0.007	34%
61. I have a strong sense of myself as a member of my ethnic group.	2.78 (0.93)	0.019	34%
62. I think friendships work best when people are from the same ethnic group.	2.22 (0.91)	0.025	34%
63. I think of myself as a typical American.	2.37 (0.94)	0.018	34%
Ethnic Identity			
64. It's easier to trust people from my own ethnic group.	2.33 (0.93)	0.022	34%
65. I often have to defend my ethnic group from criticism by other people.	2.41 (0.95)	0.018	34%
66. Discrimination against my ethnic group is not a problem. *(R)*	2.78 (0.93)	0.019	34%
67. I want my close friends to be from my own ethnic group.	2.22 (0.91)	0.034	34%
68. My ethnic group is often criticized.	2.37 (0.94)	0.014	34%
69. I believe it's important to take part in holidays that celebrate my ethnic group.	2.69 (0.96)	0.037	33%
70. The opinions of people from my ethnic group are treated as less important than those of other ethnic groups.	2.30 (0.90)	0.012	33%
71. Ethnicity plays a very little part in my family life. *(R)*	2.57 (0.95)	0.006	33%
72. I understand how to get along in mainstream American culture.	2.69 (0.90)	0.023	33%
73. I have been discriminated against because of my ethnicity.	2.25 (0.94)	0.012	33%
74. I take time to learn about the history of my ethnic group.	2.58 (0.94)	0.028	33%
75. The term "American" does not fit me. *(R)*	2.86 (0.94)	0.019	33%
76. I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs.	2.54 (0.98)	0.040	33%
Sense of Ethnic Influence			
77. I believe my sense of ethnicity is strongly influenced by my parents.	2.54 (0.96)	0.029	34%

Item	Mean (SD)	ICC	% Complete
78. Being a member of my ethnic group is an important part of who I am.	2.65 (0.97)	0.034	34%
79. My parents give me a strong sense of cultural values.	2.61 (0.96)	0.043	34%

Aim 1: Characterize Descriptive Statistics

Adolescent methamphetamine use in the past year and age of initiation was explored by stratifying the intersections by region (Northwest, Northern Plains, Upper Great Lakes, Northeast, Southeast, Southern Great Plains, and Southwest), ethnicity (AI, AI-multi-ethnic, and not AI), grade (middle school and high school), and sex (male and female). This created 84 intersections whose means were weighted based on the prevalence to the total sample. Weighting the means by the proportion for each intersection accounts for the sampling distribution in the sampling frame. For example, there are few reservation-based schools in the Northwest region and many in the Southwest region. Weighting allows for comparisons that are more representative of the AI population residing on or near reservations in what is now the contiguous United States. The weighted mean and z-score for each intersection is presented in Table 3.

Exploration of the intersections did not support hypotheses 1-3, as there was no significant pattern for differences in methamphetamine use in the past year or age of initiation between AI males and AI females, AIs in high school and AIs in middle school, and AIs in the Northern Plains region compared to AIs in the Southwest Plains. When exploring the sampling distribution of the z-scores representing the grand weighted means for each intersection, two intersections stood out as outliers as having significantly earlier age of initiation and use in the past year: 1) Adolescents who identified as male, in middle school, as AI and another ethnicity, and were in the Northeast region, and 2) Adolescents who identified as male, in high school, as

AI and another ethnicity, and were in the Southern Great Plains region. Both sets of intersections reported earlier age of initiation and using methamphetamine between 1.5 and 4 times on average in the past year, while all other intersections reported using between 0 and 1 times on average. See Table 3. A histogram of the weighted mean age of initiation for each intersection can be seen in Figure 3, and for use in the past year can be seen in Figure 4.

Table 3.
Weighted mean and Z-scores of methamphetamine age of initiation and use in the past year for each intersection.

Note. MS = Middle School; HS = High School; Significance is bolded and indicated by an *; Significance = Z-score of three or more; *n* = 14,222.

				Age of Initiation		Past Year Use	
Region	**Ethnicity**	**Grade**	**Sex**	**Weighted Mean**	**Z-Score**	**Weighted Mean**	**Z-Score**
Northwest	Not AI	MS	Male	18.86	0.26	0.30	-0.27
Northwest	Not AI	MS	Female	19.00	0.87	0.00	-0.81
Northwest	Not AI	HS	Male	18.50	-1.25	1.51	1.95
Northwest	Not AI	HS	Female	18.78	-0.07	0.54	0.18
Northwest	AI-multi-ethnic	MS	Male	18.82	0.10	0.00	-0.81
Northwest	AI-multi-ethnic	MS	Female	18.80	0.02	1.19	1.36
Northwest	AI-multi-ethnic	HS	Male	18.73	-0.29	0.65	0.37
Northwest	AI-multi-ethnic	HS	Female	18.64	-0.66	0.44	0.00
Northwest	AI Only	MS	Male	18.77	-0.10	0.85	0.74
Northwest	AI Only	MS	Female	18.82	0.10	1.26	1.48
Northwest	AI Only	HS	Male	18.82	0.12	0.77	0.59
Northwest	AI Only	HS	Female	18.93	0.56	0.00	-0.81
Northern Plains	Not AI	MS	Male	18.84	0.21	0.12	-0.58
Northern Plains	Not AI	MS	Female	18.91	0.47	0.02	-0.78
Northern Plains	Not AI	HS	Male	18.87	0.32	0.53	0.16
Northern Plains	Not AI	HS	Female	18.96	0.71	0.30	-0.26
Northern Plains	AI-multi-ethnic	MS	Male	18.73	-0.29	0.00	-0.81
Northern Plains	AI-multi-ethnic	MS	Female	18.71	-0.34	0.42	-0.03
Northern Plains	AI-multi-ethnic	HS	Male	18.60	-0.81	0.57	0.23
Northern Plains	AI-multi-ethnic	HS	Female	18.86	0.26	0.25	-0.35
Northern Plains	AI Only	MS	Male	18.94	0.63	0.20	-0.43
Northern Plains	AI Only	MS	Female	18.80	0.00	0.09	-0.65
Northern Plains	AI Only	HS	Male	18.78	-0.05	0.43	-0.02
Northern Plains	AI Only	HS	Female	18.85	0.25	0.17	-0.49

Region	Ethnicity	Grade	Sex	Age of Initiation		Past Year Use	
				Weighted Mean	Z-Score	Weighted Mean	Z-Score
Upper Great Lakes	Not AI	MS	Male	18.93	0.55	0.09	-0.63
Upper Great Lakes	Not AI	MS	Female	19.00	0.87	0.00	-0.81
Upper Great Lakes	Not AI	HS	Male	18.81	0.08	0.75	0.57
Upper Great Lakes	Not AI	HS	Female	18.90	0.44	0.33	-0.21
Upper Great Lakes	AI-multi-ethnic	MS	Male	19.00	0.87	0.63	0.34
Upper Great Lakes	AI-multi-ethnic	MS	Female	18.89	0.39	0.02	-0.76
Upper Great Lakes	AI-multi-ethnic	HS	Male	18.60	-0.81	1.03	1.07
Upper Great Lakes	AI-multi-ethnic	HS	Female	18.74	-0.24	0.90	0.83
Upper Great Lakes	AI Only	MS	Male	18.87	0.32	0.63	0.34
Upper Great Lakes	AI Only	MS	Female	18.82	0.09	0.01	-0.78
Upper Great Lakes	AI Only	HS	Male	18.59	-0.86	1.51	1.94
Upper Great Lakes	AI Only	HS	Female	18.89	0.40	0.74	0.54
Northeast	Not AI	MS	Male	18.64	-0.67	0.05	-0.71
Northeast	Not AI	MS	Female	18.40	-1.69	1.48	1.89
Northeast	Not AI	HS	Male	18.47	-1.39	1.34	1.63
Northeast	Not AI	HS	Female	19.00	0.87	0.58	0.25
Northeast	**AI-multi-ethnic**	**MS**	**Male**	**17.74***	**-4.47**	**2.22***	**3.24**
Northeast	AI-multi-ethnic	MS	Female	19.00	0.87	0.00	-0.81
Northeast	AI-multi-ethnic	HS	Male	19.00	0.87	0.00	-0.81
Northeast	AI-multi-ethnic	HS	Female	19.00	0.87	0.00	-0.81
Northeast	AI Only	MS	Male	19.00	0.87	0.00	-0.81
Northeast	AI Only	MS	Female	19.00	0.87	0.00	-0.81
Northeast	AI Only	HS	Male	19.00	0.87	0.00	-0.81
Northeast	AI Only	HS	Female	19.00	0.87	0.00	-0.81
Southeast	Not AI	MS	Male	18.79	-0.02	0.90	0.83
Southeast	Not AI	MS	Female	18.89	0.41	0.01	-0.79

Region	Ethnicity	Grade	Sex	Age of Initiation		Past Year Use	
				Weighted Mean	Z-Score	Weighted Mean	Z-Score
Southeast	Not AI	HS	Male	18.70	-0.39	1.46	1.85
Southeast	Not AI	HS	Female	18.76	-0.16	0.83	0.71
Southeast	AI-multi-ethnic	MS	Male	18.76	-0.16	0.07	-0.68
Southeast	AI-multi-ethnic	MS	Female	19.00	0.87	0.00	-0.81
Southeast	AI-multi-ethnic	HS	Male	18.52	-1.16	1.24	1.44
Southeast	AI-multi-ethnic	HS	Female	18.63	-0.71	1.20	1.38
Southeast	AI Only	MS	Male	18.78	-0.08	0.30	-0.26
Southeast	AI Only	MS	Female	18.90	0.42	0.01	-0.79
Southeast	AI Only	HS	Male	18.68	-0.48	0.49	0.08
Southeast	AI Only	HS	Female	18.92	0.52	0.21	-0.43
Southern Great Plains	Not AI	MS	Male	19.00	0.87	0.00	-0.81
Southern Great Plains	Not AI	MS	Female	19.00	0.87	0.00	-0.81
Southern Great Plains	Not AI	HS	Male	19.00	0.87	0.00	-0.81
Southern Great Plains	Not AI	HS	Female	18.77	-0.09	0.10	-0.63
Southern Great Plains	AI-multi-ethnic	MS	Male	19.00	0.87	0.00	-0.81
Southern Great Plains	AI-multi-ethnic	MS	Female	19.00	0.87	0.00	-0.81
Southern Great Plains	**AI-multi-ethnic**	**HS**	**Male**	**17.63***	**-4.95**	**2.50***	**3.74**
Southern Great Plains	AI-multi-ethnic	HS	Female	18.88	0.34	0.00	-0.81
Southern Great Plains	AI Only	MS	Male	19.00	0.87	0.00	-0.81
Southern Great Plains	AI Only	MS	Female	19.00	0.87	0.00	-0.81
Southern Great Plains	AI Only	HS	Male	19.00	0.87	0.00	-0.81
Southern Great Plains	AI Only	HS	Female	18.33	-1.95	0.25	-0.35
Southwest	Not AI	MS	Male	18.87	0.30	0.17	-0.49
Southwest	Not AI	MS	Female	18.94	0.60	0.04	-0.74
Southwest	Not AI	HS	Male	18.69	-0.45	1.39	1.72
Southwest	Not AI	HS	Female	18.90	0.45	0.19	-0.45

Region	Ethnicity	Grade	Sex	Age of Initiation		Past Year Use	
				Weighted Mean	Z-Score	Weighted Mean	Z-Score
Southwest	AI-multi-ethnic	MS	Male	18.82	0.10	0.21	-0.42
Southwest	AI-multi-ethnic	MS	Female	18.79	-0.01	0.21	-0.43
Southwest	AI-multi-ethnic	HS	Male	18.38	-1.76	1.18	1.34
Southwest	AI-multi-ethnic	HS	Female	18.75	-0.18	0.39	-0.09
Southwest	AI Only	MS	Male	18.86	0.26	0.09	-0.64
Southwest	AI Only	MS	Female	18.81	0.07	0.04	-0.73
Southwest	AI Only	HS	Male	18.69	-0.46	0.52	0.14
Southwest	AI Only	HS	Female	18.78	-0.08	0.26	-0.33

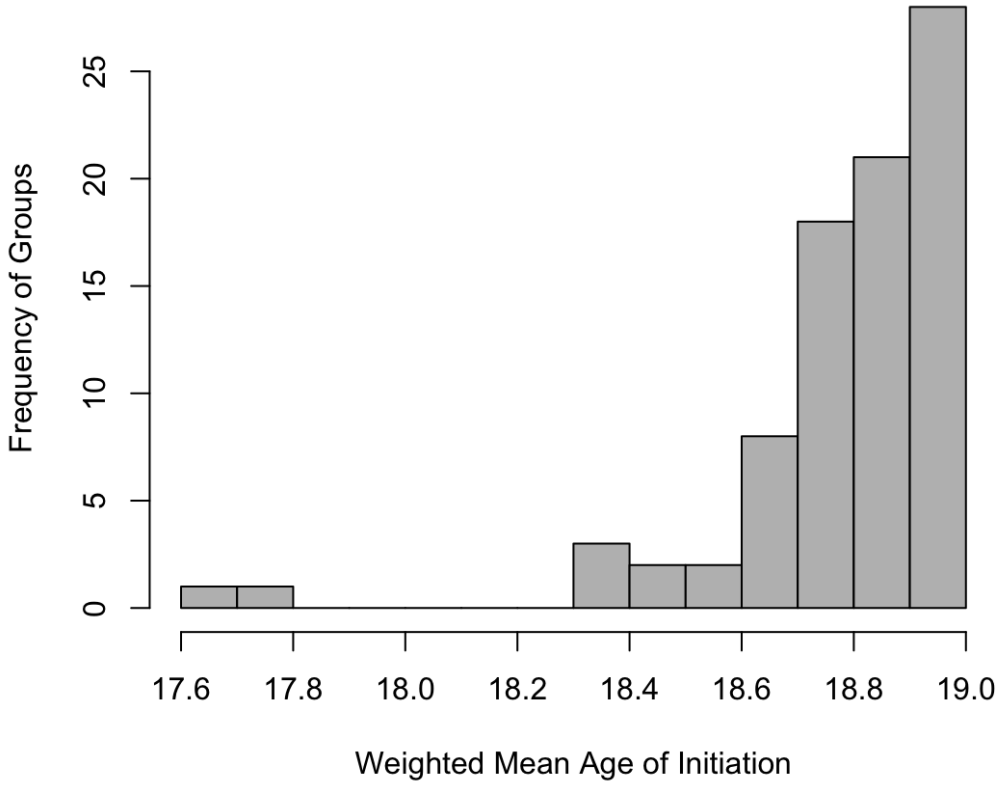

Figure 3.
Histogram representing the weighted mean age of first initiation of methamphetamine use grouped by each intersection, censored from above.

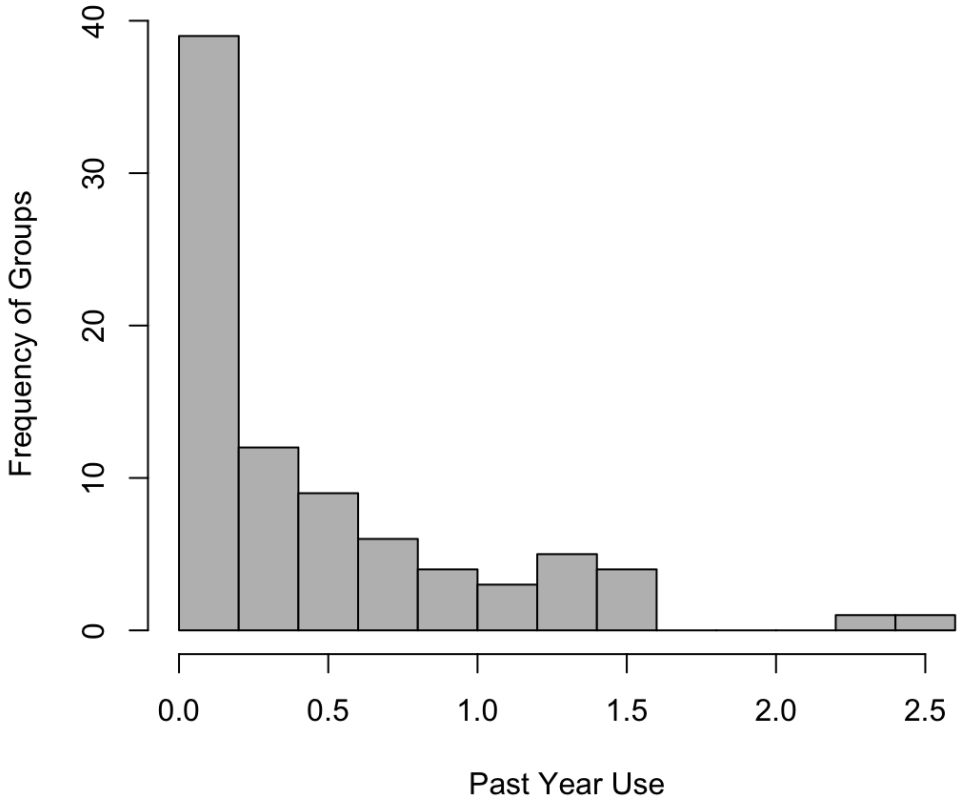

Figure 4.
Histogram representing weighted mean number of times using methamphetamine in the past year grouped by each intersection.

Aim 2: Protective Factors

The following tables presents findings for hypotheses 4 – 8 on each protective factor: parental monitoring, peer/social influence, positive self-esteem, ethnic pride, and ethnic experience. The first table in each section includes CFA and invariance testing for model fit of each protective factor and includes the factor scores for each item. The following two tables present results from two SEMs for methamphetamine use; one with the censored regression of age of initiation and likelihood of initiation, and the other with the penalized likelihood for use in the past year. Interpretations of the SEMs include direct effects for the standardized estimates for

age of initiation and odd ratios (OR) for the binary outcome capturing the likelihood of having initiated methamphetamine use, which was calculated by exponentiating the unstandardized coefficients (logits). It is important to note that both models testing hypothesis 9 (that included all protective factors into one model for each methamphetamine outcome variable) did not converge, despite attempts to increase the starting point, increase the number of iterations, and use of various estimates. Due to this convergence issue, hypothesis 9 was unable to be tested accurately and results were not presented.

Model Results: Parental Monitoring

The EFA of parental monitoring indicated that it was best represented by a three-factor model, which was confirmed by the CFA. These findings confirm the model presented by Swaim and Stanley (2022) whose analytical sample differed slightly due to inclusion criteria. This confirmed model identified the three factors as parental knowledge, parental control, and a combined factor of child disclosure with parental solicitation. CFA model fit for parental monitoring was in the excellent range (see Table 4). The factor loadings for parental monitoring ranged from 0.60 to 0.94 and were all statistically significant. Invariance testing indicated that the scalar model was the most parsimonious for both sex and grade group.

Hypothesis 4: Parental Monitoring Predicting Age of Initiation

Results from hypothesis 4 for age of initiation are presented in Table 5. Parental knowledge was significantly and positively related to the likelihood of being at the censored value (i.e., not having initiated methamphetamine use). This was such that for each one-unit increase in parental knowledge, AI adolescents were 2.60 times less likely to have initiated methamphetamine use. Parental control and child disclosure/parental solicitation were not significantly related to predicting the likelihood of having initiated methamphetamine use.

Parental knowledge, parental control, and child disclosure/parental solicitation were not significantly related to predicting age of methamphetamine use initiation. See Table 5.

Hypothesis 4: Parental Monitoring Predicting Likelihood of Use in Past Year

Results from hypothesis 4 for likelihood of use in the past year are presented in Table 6. There was a significant direct effect for parental knowledge predicting methamphetamine use in the past year, such that AI adolescents were 4.17 times more likely to not have used for each one-unit increase in parental knowledge. Parental control and child disclosure/parental solicitation was not significant, indicating that there was no evidence of an effect from these factors predicting the likelihood of using methamphetamine in the past year. See Table 6.

Table 4.
Model fit, factor loadings, and invariance testing of Parental Monitoring.

Note. CFA = Confirmatory Factor Analysis; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; χ^2 = Chi-Square; PK = Parental Knowledge; PC = Parental Control; CDPS = Child Disclosure Parental Solicitation; *df* = Degrees of Freedom; CFI difference = Difference in CFI from the prior model; SABIC = Sample-Adjusted Bayesian Information Criterion; *n* = 3,703.

CFA Model Fit				
RMSEA	CFI	TLI	SRMR	χ^2
0.06 [.05, .06] p < .01	0.96	0.95	0.04	χ^2 (51) = 661, p < .01

Factor Loadings			
Items	Factor 1 (PK)	Factor 2 (PC)	Factor 3 (CDPS)
1. My parents know where I am after school.	0.75		
2. When I go out at night, my parents know who I am with.	0.93		
3. When I go out at night, my parents know where I am.	0.94		
4. When I go out on weekend nights, I have to be home by a set time.		0.65	
5. I have to tell my parents who I'm with and what I'm doing at night with friends.		0.83	
6. I have to tell my parents my plans for weekend nights.		0.80	
7. I need permission to be out late on weeknights.		0.74	
8. I tell my parents how I'm doing in school.			0.76
9. I tell my parents about my activities with friends.			0.87
10. My parents ask what I do in my free time.			0.80
11. My parents ask about things that happen at school.			0.82
12. My parents talk to my friends.			0.60

Invariance Testing

Sex						
	χ^2 (*df*)	CFI	CFI difference	RMSEA	SRMR	SABIC
Configural	771 (102)	0.96	0.002	0.06	0.04	114408
Metric	795 (111)	0.96	0.001	0.06	0.04	114377
Scalar	839 (120)	0.96	0.002	0.06	0.04	114377

Invariance Testing						
Grade Group						
	χ^2 (*df*)	CFI	CFI difference	RMSEA	SRMR	SABIC
Configural	759 (102)	0.97	0.003	0.06	0.04	115057
Metric	796 (111)	0.97	0.001	0.06	0.05	115062
Scalar	875 (120)	0.96	0.004	0.06	0.05	115119

Table 5.
SEM with Censored Regression of Age of Initiation on Parental Monitoring.

Note: OR = odds ratio; SE = standard error; b = unstandardized regression coefficient; **p*-value < 0.05; *n* = 3,703.

Likelihood of Initiation		OR	SE	*p*-value
Direct Effect	Parental Knowledge	**2.60***	0.19	<0.01
	Parental Control	0.89	0.46	0.81
	Child Disclosure/Parental Solicitation	0.83	0.41	0.65
Age of Initiation		b	SE	*p*-value
Direct Effect	Parental Knowledge	0.11	0.15	0.49
	Parental Control	-0.19	0.43	0.66
	Child Disclosure/Parental Solicitation	0.17	0.39	0.66

Factor Loadings			
Items	Parental Knowledge	Parental Control	Child Disclosure/ Parental Solicitation
1. My parents know where I am after school.	0.75		
2. When I go out at night, my parents know who I am with.	0.93		
3. When I go out at night, my parents know where I am.	0.94		
4. When I go out on weekend nights, I have to be home by a set time.		0.65	
5. I have to tell my parents who I'm with and what I'm doing at night with friends.		0.83	
6. I have to tell my parents my plans for weekend nights.		0.80	
7. I need permission to be out late on weeknights.		0.74	
8. I tell my parents how I'm doing in school.			0.76
9. I tell my parents about my activities with friends.			0.87
10. My parents ask what I do in my free time.			0.80
11. My parents ask about things that happen at school.			0.82
12. My parents talk to my friends.			0.60

Table 6.
Firth's Penalized Logistic Regression of Past Year Use on Parental Monitoring.

Note: OR = odds ratio; SE = standard error; Parental Monitoring latent variable was on a 1 – 5 scale with higher scores indicating increased support; **p*-value < 0.05; *n* = 3,703. Penalized estimates reported in this model were conducted in RStudio while factor loadings were obtained from the measurement model run in Mplus.

Penalized Likelihood for Past Year Use		OR	SE	*p*-value
Direct Effect	Parental Knowledge	**0.24***	0.23	<0.01
	Parental Control	1.41	0.51	0.51
	Child Disclosure/Parental Solicitation	1.23	0.37	0.58

Factor Loadings			
Items	Parental Knowledge	Parental Control	Child Disclosure/ Parental Solicitation
1. My parents know where I am after school.	0.79		
2. When I go out at night, my parents know who I am with.	0.90		
3. When I go out at night, my parents know where I am.	0.91		
4. When I go out on weekend nights, I have to be home by a set time.		0.63	
5. I have to tell my parents who I'm with and what I'm doing at night with friends.		0.85	
6. I have to tell my parents my plans for weekend nights.		0.81	
7. I need permission to be out late on weeknights.		0.74	
8. I tell my parents how I'm doing in school.			0.79
9. I tell my parents about my activities with friends.			0.87
10. My parents ask what I do in my free time.			0.77
11. My parents ask about things that happen at school.			0.82
12. My parents talk to my friends.			0.59

Model Results: Peer/Social Influence

The EFA of peer/social influence indicated that it was best represented by a four-factor model, which was confirmed by the CFA. These findings corroborate the model presented by Swaim and colleagues (1993), which identified the four factors as peer substance use, peer offers to use, peer disapproval of use, and perceived peer pressure. CFA model fit for peer/social influence was in the good range (see Table 7). The factor loadings for peer/social influence ranged from 0.56 to 0.99 and were all statistically significant. Invariance testing indicated that the scalar model was the most parsimonious for both sex and grade group.

Hypothesis 5: Peer/Social Influence Predicting Age of Initiation

Results from hypothesis 5 for age of initiation are presented in Table 8. Peer substance use was significantly and negatively related to the likelihood of being at the censored value (i.e., not having initiated methamphetamine use). This was such that for each one-unit increase in peer substance use, AI adolescents were 2.20 times more likely to have initiated methamphetamine use. Peer offers to use significantly and negatively predicted a lower likelihood of being at the censored value. This was such that for each one unit increase in peers offering to use, participants were 1.55 times more likely to have initiated methamphetamine use. Lastly, perceived peer pressure also significantly and negatively predicted a lower likelihood of being at the censored value, such that each one unit increase in perceived peer pressure led to participants being 1.23 times more likely to have initiated methamphetamine use. Peer disapproval of use was not significantly related to likelihood of initiation.

Perceived peer pressure significantly and negatively predicted age of methamphetamine use initiation, such that for each one unit increase in perceived peer pressure, the predicted age of

initiation decreased by 0.2 years. Peer substance use, peers offer to use, and peer disapproval of use were not significantly related to the age of initiating methamphetamine use. See Table 8.

Hypothesis 5: Peer/Social Influence Predicting Likelihood of Use in Past Year

Results from hypothesis 5 for likelihood of use in the past year are presented in Table 9. There was a significant direct effect for peer substance use predicting methamphetamine use in the past year, such that AI adolescents were 2.78 times more likely to not have used for each one-unit increase in reporting less peer substance use. Similarly, peer offers to use and perceived peer pressure produced a significant direct effect such that the likelihood to have not used methamphetamine in the past year were 1.92 and 1.43 times more for each one-unit increase in participants reporting less peers offering to use and less perceived peer pressure, respectively. Peer disapproval of use was not significant, indicating that there was no evidence of an effect from this factor predicting the likelihood of using methamphetamine in the past year. See Table 9.

Table 7.
Model fit, factor loadings, and invariance testing of Peer/Social Influence.

Note. CFA = Confirmatory Factor Analysis; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; χ^2 = Chi-Square; PSU = Peer Substance Use; POU = Peer Offers to Use; PDU = Peer Disapproval of Use; PPP = Perceived Peer Pressure; *(R)* = Item was reverse coded; *df* = Degrees of Freedom; CFI difference = Difference in CFI from the prior model; SABIC = Sample-Adjusted Bayesian Information Criterion; *n* = 5,886.

CFA Model Fit				
RMSEA	CFI	TLI	SRMR	χ^2
0.09 [.08, .09] p < .01	0.87	0.85	0.06	χ^2 (164) = 6875, p < .01

Factor Loadings				
Items	Factor 1 (PSU)	Factor 2 (POU)	Factor 3 (PDU)	Factor 4 (PPP)
1. How many of your friends… Drink alcohol? *(R)*	0.95			
2. How many of your friends… Get drunk? *(R)*	0.95			
3. How many of your friends… Smoke cigarettes? *(R)*	0.66			
4. How many of your friends… Use marijuana? *(R)*	0.74			
5. How many of your friends… Use other illegal drugs? *(R)*	0.56			
6. How often have your friends asked you to… Drink alcohol? *(R)*		0.96		
7. How often have your friends asked you to… Get drunk? *(R)*		0.96		
8. How often have your friends asked you to… Smoke cigarettes? *(R)*		0.66		
9. How often have your friends asked you to… Use marijuana? *(R)*		0.70		
10. How often have your friends asked you to… Use other illegal drugs? *(R)*		0.58		
11. How much would your friends try to stop you from… Drinking alcohol?			0.98	
12. How much would your friends try to stop you from… Getting drunk?			0.99	
13. How much would your friends try to stop you from… Smoking cigarettes?			0.87	
14. How much would your friends try to stop you from… Using marijuana?			0.81	
15. How much would your friends try to stop you from… Using other illegal drugs?			0.82	
16. How much pressure do you feel from your friends and schoolmates to… Drink alcohol? *(R)*				0.97

Factor Loadings				
Items	Factor 1 (PSU)	Factor 2 (POU)	Factor 3 (PDU)	Factor 4 (PPP)
17. How much pressure do you feel from your friends and schoolmates to… Get drunk? *(R)*				0.98
18. How much pressure do you feel from your friends and schoolmates to… Smoke cigarettes? *(R)*				0.90
19. How much pressure do you feel from your friends and schoolmates to… Use marijuana? *(R)*				0.81
20. How much pressure do you feel from your friends and schoolmates to… Use other illegal drugs? *(R)*				0.84

Invariance Testing						
Sex						
	χ^2 (*df*)	CFI	CFI difference	RMSEA	SRMR	SABIC
Configural	7270 (328)	0.87	0.002	0.09	0.06	210462
Metric	7380 (344)	0.87	0.001	0.09	0.06	210496
Scalar	7525 (360)	0.87	0.003	0.09	0.06	210505
Grade Group						
	χ^2 (*df*)	CFI	CFI difference	RMSEA	SRMR	SABIC
Configural	7318 (328)	0.87	0.004	0.09	0.06	210112
Metric	7267 (344)	0.87	0.001	0.09	0.06	210260
Scalar	7082 (360)	0.87	0.004	0.08	0.06	210338

Table 8.
SEM with Censored Regression of Age of Initiation on Peer/Social Influence.

Note: OR = odds ratio; SE = standard error; b = unstandardized regression coefficient; *(R)* = Item was reverse coded; **p*-value < 0.05; *n* = 5,886.

Likelihood of Initiation		OR	SE	*p*-value
Direct Effect	Peer Substance Use	**2.20***	0.13	<0.01
	Peer Offers to Use	**1.55***	0.10	<0.01
	Peer Disapproval of Use	1.08	0.09	0.42
	Perceived Peer Pressure	**1.23***	0.08	0.01
Age of Initiation		b	SE	*p*-value
Direct Effect	Peer Substance Use	-0.20	0.14	0.17
	Peer Offers to Use	0.16	0.11	0.15
	Peer Disapproval of Use	0.15	0.14	0.29
	Perceived Peer Pressure	**0.20***	0.09	0.03

Factor Loadings				
Items	Peer Substance Use	Peer Offers to Use	Peer Disapproval of Use	Perceived Peer Pressure
1. How many of your friends… Drink alcohol? *(R)*	0.95			
2. How many of your friends… Get drunk? *(R)*	0.95			
3. How many of your friends… Smoke cigarettes? *(R)*	0.67			
4. How many of your friends… Use marijuana? *(R)*	0.74			
5. How many of your friends… Use other illegal drugs? *(R)*	0.57			
6. How often have your friends asked you to… Drink alcohol? *(R)*		0.96		
7. How often have your friends asked you to… Get drunk? *(R)*		0.96		
8. How often have your friends asked you to… Smoke cigarettes? *(R)*		0.66		
9. How often have your friends asked you to… Use marijuana? *(R)*		0.71		
10. How often have your friends asked you to… Use other illegal drugs? *(R)*		0.58		

Factor Loadings				
Items	Peer Substance Use	Peer Offers to Use	Peer Disapproval of Use	Perceived Peer Pressure
11. How much would your friends try to stop you from… Drinking alcohol?			0.98	
12. How much would your friends try to stop you from… Getting drunk?			0.99	
13. How much would your friends try to stop you from… Smoking cigarettes?			0.87	
14. How much would your friends try to stop you from… Using marijuana?			0.81	
15. How much would your friends try to stop you from… Using other illegal drugs?			0.82	
16. How much pressure do you feel from your friends and schoolmates to… Drink alcohol? *(R)*				0.97
17. How much pressure do you feel from your friends and schoolmates to… Get drunk? *(R)*				0.98
18. How much pressure do you feel from your friends and schoolmates to… Smoke cigarettes? *(R)*				0.90
19. How much pressure do you feel from your friends and schoolmates to… Use marijuana? *(R)*				0.81
20. How much pressure do you feel from your friends and schoolmates to… Use other illegal drugs? *(R)*				0.84

Table 9.
Firth's Penalized Logistic Regression of Past Year Use on Peer/Social Influence.

Note: OR = odds ratio; SE = standard error; b = unstandardized regression coefficient; *(R)* = Item was reverse coded; Peer/Social Influence latent variable was on a 1 – 4 scale with higher scores indicating increased support not to use; **p*-value < 0.05; *n* = 5,886. Penalized estimates reported in this model were conducted in RStudio while factor loadings were obtained from the measurement model run in Mplus.

Penalized Likelihood for Past Year Use		OR	SE	*p*-value
Direct Effect	Peer Substance Use	**0.36***	0.22	<0.01
	Peer Offers to Use	**0.52***	0.21	<0.01
	Peer Disapproval of Use	0.90	0.10	0.30
	Perceived Peer Pressure	**0.70***	0.10	<0.01

Factor Loadings				
Items	Peer Substance Use	Peer Offers to Use	Peer Disapproval of Use	Perceived Peer Pressure
1. How many of your friends… Drink alcohol? *(R)*	0.83			
2. How many of your friends… Get drunk? *(R)*	0.85			
3. How many of your friends… Smoke cigarettes? *(R)*	0.74			
4. How many of your friends… Use marijuana? *(R)*	0.71			
5. How many of your friends… Use other illegal drugs? *(R)*	0.71			
6. How often have your friends asked you to… Drink alcohol? *(R)*		0.85		
7. How often have your friends asked you to… Get drunk? *(R)*		0.86		
8. How often have your friends asked you to… Smoke cigarettes? *(R)*		0.74		
9. How often have your friends asked you to… Use marijuana? *(R)*		0.74		
10. How often have your friends asked you to… Use other illegal drugs? *(R)*		0.69		
11. How much would your friends try to stop you from… Drinking alcohol?			0.98	
12. How much would your friends try to stop you from… Getting drunk?			0.97	
13. How much would your friends try to stop you from… Smoking cigarettes?			0.84	
14. How much would your friends try to stop you from… Using marijuana?			0.94	

Factor Loadings				
Items	Peer Substance Use	Peer Offers to Use	Peer Disapproval of Use	Perceived Peer Pressure
15. How much would your friends try to stop you from… Using other illegal drugs?			0.74	
16. How much pressure do you feel from your friends and schoolmates to… Drink alcohol? *(R)*				0.97
17. How much pressure do you feel from your friends and schoolmates to… Get drunk? *(R)*				0.96
18. How much pressure do you feel from your friends and schoolmates to… Smoke cigarettes? *(R)*				0.90
19. How much pressure do you feel from your friends and schoolmates to… Use marijuana? *(R)*				0.85
20. How much pressure do you feel from your friends and schoolmates to… Use other illegal drugs? *(R)*				0.83

Model Results: Positive Self-Esteem

The EFA of positive self-esteem indicated that it was best represented by a two-factor model, which was confirmed by the CFA. These findings corroborate the model presented by Haruyama and colleagues (2024), which identified the two factors as internal and external self-esteem. CFA model fit for positive self-esteem was in the good range (see Table 10). The factor loadings for positive self-esteem ranged from 0.44 to 0.85 and were all statistically significant. Invariance testing indicated that the scalar model was the most parsimonious for both sex and grade group.

Hypothesis 6: Positive Self-Esteem Predicting Age of Initiation

Results from hypothesis 6 for age of initiation are presented in Table 11. Internal self-esteem was significantly and positively related to the likelihood of being at the censored value (i.e., not having initiated methamphetamine use). This was such that for each one-unit increase in internal self-esteem, AI adolescents were 1.94 times less likely to have initiated

methamphetamine use. External self-esteem was not significantly related to the likelihood of having initiated methamphetamine use. Both internal and external self-esteem did not significantly predict age of methamphetamine use initiation. See Table 11.

Hypothesis 6: Positive Self-Esteem Predicting Likelihood of Use in Past Year

Results from hypothesis 6 for likelihood of use in the past year are presented in Table 12. There was a significant direct effect for both internal and external self-esteem predicting methamphetamine use in the past year. This was such that AI adolescents were 3.33 and 1.41 times more likely to not have used for each one-unit increase in internal and external self-esteem, respectively. See Table 12.

Table 10.
Model fit, factor loadings, and invariance testing of Self-Esteem.

Note. CFA = Confirmatory Factor Analysis; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; χ^2 = Chi-Square; SEI = Self-Esteem Internal; SEE = Self-Esteem External; *df* = Degrees of Freedom; CFI difference = Difference in CFI prior model; SABIC = Sample-Adjusted Bayesian Information Criterion; *n* = 5,247.

CFA Model Fit				
RMSEA	CFI	TLI	SRMR	χ^2
0.08 [.08, .08] p < .01	0.94	0.92	0.06	χ^2 (34) = 1130, p < .01

Factor Loadings		
Items	Factor 1 (SEI)	Factor 2 (SEE)
1. I am proud of myself.	0.84	
2. I am able to do things well.	0.74	
3. I like myself.	0.84	
4. I am lucky.	0.64	
5. I am smart.	0.63	
6. I am good at games.	0.44	
7. Other people my age like me.		0.71
8. Other people my age like to be with me.		0.80
9. People like me.		0.85
10. I am good looking.		0.61

Invariance Testing

Sex						
	χ^2 (*df*)	CFI	CFI difference	RMSEA	SRMR	SABIC
Configural	1299 (68)	0.93	0.004	0.09	0.06	113059
Metric	1321 (76)	0.93	0.001	0.08	0.06	113037
Scalar	1657 (84)	0.91	0.018	0.09	0.07	113401
Grade Group						
	χ^2 (*df*)	CFI	CFI difference	RMSEA	SRMR	SABIC
Configural	1300 (68)	0.93	0.004	0.09	0.06	113951
Metric	1337 (76)	0.93	0.002	0.08	0.06	113920
Scalar	1378 (84)	0.93	0.002	0.08	0.07	113959

Table 11.
SEM with Censored Regression of Age of Initiation on Self-Esteem.

Note: OR = odds ratio; SE = standard error; b = unstandardized regression coefficient; **p*-value < 0.05; *n* = 5,247.

Likelihood of Initiation		OR	SE	*p*-value
Direct Effect	Self-Esteem Internal	**1.94***	0.19	<0.01
	Self-Esteem External	0.86	0.21	0.45
Age of Initiation		b	SE	*p*-value
Direct Effect	Self-Esteem Internal	0.20	0.10	0.051
	Self-Esteem External	-0.10	0.11	0.38

Factor Loadings		
Items	Self-Esteem Internal	Self-Esteem External
1. I am proud of myself.	0.84	
2. I am able to do things well.	0.74	
3. I like myself.	0.84	
4. I am lucky.	0.64	
5. I am smart.	0.63	
6. I am good at games.	0.44	
7. Other people my age like me.		0.71
8. Other people my age like to be with me.		0.80
9. People like me.		0.85
10. I am good looking.		0.61

Table 12.
Firth's Penalized Logistic Regression of Past Year Use on Self-Esteem.

Note: OR = odds ratio; SE = standard error; b = unstandardized regression coefficient; Self-Esteem latent variable was on a 1 – 4 scale with higher scores indicating better self-esteem; **p*-value < 0.05; *n* = 5,247. Penalized estimates reported in this model were conducted in RStudio while factor loadings were obtained from the measurement model run in Mplus.

Penalized Likelihood for Past Year Use		OR	SE	*p*-value
Direct Effect	Self-Esteem Internal	**0.30***	0.21	<0.01
	Self-Esteem External	**0.71***	0.24	0.03

Factor Loadings		
Items	Self-Esteem Internal	Self-Esteem External
1. I am proud of myself.	0.77	
2. I am able to do things well.	0.73	
3. I like myself.	0.78	
4. I am lucky.	0.67	
5. I am smart.	0.67	
6. I am good at games.	0.47	
7. Other people my age like me.		0.75
8. Other people my age like to be with me.		0.66
9. People like me.		0.78
10. I am good looking.		0.72

Model Results: Ethnic Pride

The EFA of ethnic pride indicated that it was best represented by a one-factor model, which was confirmed by the CFA. These findings corroborate the model presented by Phinney (1992), which identified all items loading onto the one factor of ethnic pride. CFA model fit for ethnic pride was in the good range (see Table 13). The factor loadings for ethnic pride ranged from 0.80 to 0.93 and were all statistically significant. Invariance testing indicated that the scalar model was the most parsimonious for both sex and grade group.

Hypothesis 7: Ethnic Pride Predicting Age of Initiation

Results from hypothesis 7 for age of initiation are presented in Table 14. Ethnic pride did not significantly predict the likelihood of having initiated methamphetamine use. Ethnic pride also did not significantly predict age of methamphetamine use initiation. See Table 14.

Hypothesis 7: Ethnic Pride Predicting Likelihood of Use in Past Year

Results from hypothesis 7 for likelihood of use in the past year are presented in Table 15. Ethnic pride was not significant, indicating that there was no evidence of an effect from this factor on the likelihood of using methamphetamine in the past year. See Table 15.

Table 13.
Model fit, factor loadings, and invariance testing of Ethnic Pride.

Note. CFA = Confirmatory Factor Analysis; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; χ^2 = Chi-Square; EP = Ethnic Pride; *df* = Degrees of Freedom; CFI difference = Difference in CFI from the prior model; SABIC = Sample-Adjusted Bayesian Information Criterion; *n* = 5,247.

CFA Model Fit				
RMSEA	CFI	TLI	SRMR	χ^2
0.13 [.13, .14] p < .01	0.94	0.92	0.03	χ^2 (20) = 1664, p < .01

Factor Loadings	
Items	Factor 1 (EP)
1. I am proud to be a member of my ethnic group.	0.86
2. I try to find out more about the history and traditions of my ethnic group.	0.80
3. I feel a strong attachment to my ethnic group.	0.86
4. I have a lot of pride in my ethnic group.	0.88
5. I feel good about my ethnicity.	0.91
6. I am happy that I am a member of my ethnic group.	0.93
7. My ethnic roots give me strength.	0.90
8. My family does a lot to hold onto our ethnic identity and beliefs.	0.80

Invariance Testing						
Sex						
	χ^2 (*df*)	CFI	CFI difference	RMSEA	SRMR	SABIC
Configural	1664 (40)	0.93	0.015	0.13	0.03	74914
Metric	1846 (47)	0.92	0.006	0.13	0.04	74880
Scalar	1972 (54)	0.91	0.005	0.12	0.04	74867
Grade Group						
	χ^2 (*df*)	CFI	CFI difference	RMSEA	SRMR	SABIC
Configural	1827 (40)	0.94	0.001	0.14	0.03	75152
Metric	2005 (47)	0.94	0.006	0.13	0.04	75120
Scalar	2108 (54)	0.93	0.003	0.13	0.04	75139

Table 14.
SEM with Censored Regression of Age of Initiation on Ethnic Pride.

Note: OR = odds ratio; SE = standard error; b = unstandardized regression coefficient; *p-value < 0.05; n = 5,247.

Likelihood of Initiation		OR	SE	p-value
Direct Effect	Ethnic Pride	1.06	0.09	0.46
Age of Initiation		b	SE	p-value
Direct Effect	Ethnic Pride	0.04	0.07	0.55

Factor Loadings	
Items	Ethnic Pride
1. I am proud to be a member of my ethnic group.	0.86
2. I try to find out more about the history and traditions of my ethnic group.	0.80
3. I feel a strong attachment to my ethnic group.	0.86
4. I have a lot of pride in my ethnic group.	0.88
5. I feel good about my ethnicity.	0.91
6. I am happy that I am a member of my ethnic group.	0.93
7. My ethnic roots give me strength.	0.90
8. My family does a lot to hold onto our ethnic identity and beliefs.	0.80

Table 15.
Firth's Penalized Logistic Regression of Past Year Use on Ethnic Pride.

Note: OR = odds ratio; SE = standard error; b = unstandardized regression coefficient; Ethnic Pride latent variable was on a 1 – 4 scale with higher scores indicating increased pride; *p-value < 0.05; n = 5,247. Penalized estimates reported in this model were conducted in RStudio while factor loadings were obtained from the measurement model run in Mplus.

Penalized Likelihood for Past Year Use		OR	SE	p-value
Direct Effect	Ethnic Pride	0.88	0.09	0.18
Factor Loadings				
Items				Ethnic Pride
1.	I am proud to be a member of my ethnic group.			0.87
2.	I try to find out more about the history and traditions of my ethnic group.			0.81
3.	I feel a strong attachment to my ethnic group.			0.87
4.	I have a lot of pride in my ethnic group.			0.89
5.	I feel good about my ethnicity.			0.89
6.	I am happy that I am a member of my ethnic group.			0.92
7.	My ethnic roots give me strength.			0.89
8.	My family does a lot to hold onto our ethnic identity and beliefs.			0.79

Model Results: Ethnic Experience

EFA of ethnic experience indicated that it was best represented by a four-factor model, which was confirmed by the CFA. While these findings are similar to the four-factor model presented by Malcarne and colleagues (2006) on the Scale of Ethnic Experience, the item structure of the factors differed. Malcarne and colleagues (2006) identified the four factors in their study as ethnic identity, perceived discrimination, mainstream comfort, and social affiliation. Their model was measured with a CFA using the data from this study and indicated bad model fit with poor factor loadings. This could be due to the adaptation of some of the items, as the wording varied in this study compared to the original Scale of Ethnic Experience. This study's EFA of these items with the Tri-Ethnic data was confirmed by the CFA and appeared to

suggest four factors labeled as ethnic group importance, ethnic affiliation, ethnic identity, and sense of ethnic influence. The ethnic group importance factor contained items that demonstrated the significance of being part of their ethnic group and feeling that they belong, while the ethnic affiliation factor contained items that reflected an individual's attitude towards being a member of their own ethnic group versus other groups. The ethnic identity factor consisted of items reflecting an individual's ethnic pride and participation in cultural activities, while the sense of ethnic influence factor contained items that demonstrated a strong sense of ethnicity that was influenced by others. CFA model fit for ethnic experience was in the poor range and results should be interpreted with caution (see Table 16). This limitation will be discussed further in the Discussion section. The factor loadings for ethnic experience ranged from 0.50 to 0.87 and were all statistically significant. Invariance testing indicated that the scalar model was the most parsimonious for both sex and grade group.

Hypothesis 8: Ethnic Experience Predicting Age of Initiation

Results from hypothesis 8 for age of initiation are presented in Table 17. Multiple convergence issues occurred when modeling ethnic experience on age of initiation. Specifically, the censored inflation logistic portion of the model did not converge despite trying a variety of strategies (increasing the start point, increasing the number of iterations, using different estimates, etc.). This issue prevented the ability to analyze if ethnic experience predicted the likelihood of being at the censored value (or ever having used methamphetamine). This is a limitation to this study.

To measure the impact of ethnic experience on the age of initiation for AI adolescents, Bayes estimation without censored inflation was completed. Results indicated that ethnic

experience (ethnic group importance, social affiliation, ethnic identity, and engagement with ethnic group) did not significantly predict age of methamphetamine use initiation. See Table 17.

Hypothesis 8: Ethnic Experience Predicting Likelihood of Use in Past Year

Results from hypothesis 8 for likelihood of use in the past year are presented in Table 18. There was a significant direct effect for all ethnic experience factors predicting methamphetamine use in the past year. This was such that the likelihood to have not used in the past year were 1.18 times more for each one-unit increase in ethnic group importance, 4.35 times more for each one-unit increase in ethnic affiliation, 5.56 times more for each one-unit increase in ethnic identity, and 50 times more for each one-unit increase in sense of ethnic influence. See Table 18.

Table 16.
Model fit, factor loadings, and invariance testing of Ethnic Experience.

Note. CFA = Confirmatory Factor Analysis; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; χ^2 = Chi-Square; EGI = Ethnic Group Importance; EA = Ethnic Affiliation; EI = Ethnic Identity; SEI = Sense of Ethnic Influence; *(R)* = Item was reverse coded; *df* = Degrees of Freedom; CFI difference = Difference in CFI from the prior model; SABIC = Sample-Adjusted Bayesian Information Criterion; *n* = 3,703.

CFA Model Fit				
RMSEA	CFI	TLI	SRMR	χ^2
0.09 [.08, .09] p < .01	0.79	0.77	0.08	χ^2 (371) = 9646, p < .01

Factor Loadings				
Items	Factor 1 (EGI)	Factor 2 (EA)	Factor 3 (EI)	Factor 4 (SEI)
1. Holidays related to my ethnicity are important to me.	0.82			
2. My ethnic group is respected.	0.87			
3. My ethnic group is treated well.	0.85			
4. Ethnicity is important to my parents.	0.84			
5. In groups, I feel most comfortable if most people there belong to my ethnic group.	0.80			
6. I feel like I belong to mainstream American culture.	0.71			
7. My ethnic group plays a big role in how I live my life.	0.82			
8. I don't think it's necessary to learn about the history of my ethnic group. *(R)*		0.57		
9. Ethnic pride is not very important to a child's upbringing. *(R)*		0.61		
10. My ethnic group doesn't have the same opportunities as other ethnic groups.		0.70		
11. I have a strong sense of myself as a member of my ethnic group.		0.73		
12. I think friendships work best when people are from the same ethnic group.		0.73		
13. I think of myself as a typical American.		0.60		
14. It's easier to trust people from my own ethnic group.			0.70	
15. I often have to defend my ethnic group from criticism by other people.			0.75	
16. Discrimination against my ethnic group is not a problem. *(R)*			0.50	

Factor Loadings				
Items	Factor 1 (EGI)	Factor 2 (EA)	Factor 3 (EI)	Factor 4 (SEI)
17. I want my close friends to be from my own ethnic group.			0.66	
18. My ethnic group is often criticized.			0.67	
19. I believe it's important to take part in holidays that celebrate my ethnic group.			0.80	
20. The opinions of people from my ethnic group are treated as less important than those of other ethnic groups.			0.73	
21. Ethnicity plays a very little part in my family life. *(R)*			0.56	
22. I understand how to get along in mainstream American culture.			0.74	
23. I have been discriminated against because of my ethnicity.			0.66	
24. I take time to learn about the history of my ethnic group.			0.82	
25. The term "American" does not fit me. *(R)*			0.54	
26. I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs.			0.74	
27. I believe my sense of ethnicity is strongly influenced by my parents.				0.73
28. Being a member of my ethnic group is an important part of who I am.				0.87
29. My parents give me a strong sense of cultural values.				0.84

Invariance Testing

Sex						
	χ^2 (*df*)	CFI	CFI difference	RMSEA	SRMR	SABIC
Configural	9861 (742)	0.79	0.003	0.09	0.08	201759
Metric	10037 (767)	0.79	0.003	0.09	0.09	201732
Scalar	10268 (792)	0.78	0.005	0.08	0.09	201836
Grade Group						
	χ^2 (*df*)	CFI	CFI difference	RMSEA	SRMR	SABIC
Configural	10680 (742)	0.79	0.003	0.09	0.08	203085
Metric	10848 (767)	0.79	0.003	0.09	0.08	203027
Scalar	10923 (792)	0.78	0.001	0.09	0.08	203112

Table 17.
SEM with Censored Regression of Age of Initiation on Ethnic Experience.

Note: OR = odds ratio; SE = standard error; b = unstandardized regression coefficient; *(R)* = Item was reverse coded; **p*-value < 0.05; *n* = 3,703.

Likelihood of Initiation		OR	SE	*p*-value
Direct Effect	Ethnic Group Importance Social Affiliation Ethnic Identity Engagement with Ethnic Group	Model did not converge.		

Age of Initiation		b	SE	*p*-value
Direct Effect	Ethnic Group Importance	-0.01	0.07	0.44
	Social Affiliation	-0.11	0.09	0.10
	Ethnic Identity	-0.11	0.10	0.13
	Engagement with Ethnic Group	0.22	0.14	0.06

Factor Loadings

Items	Ethnic Group Importance	Ethnic Affiliation	Ethnic Identity	Sense of Ethnic Influence
1. Holidays related to my ethnicity are important to me.	0.82			
2. My ethnic group is respected.	0.87			
3. My ethnic group is treated well.	0.85			
4. Ethnicity is important to my parents.	0.84			
5. In groups, I feel most comfortable if most people there belong to my ethnic group.	0.80			
6. I feel like I belong to mainstream American culture.	0.71			
7. My ethnic group plays a big role in how I live my life.	0.82			
8. I don't think it's necessary to learn about the history of my ethnic group. *(R)*		0.57		
9. Ethnic pride is not very important to a child's upbringing. *(R)*		0.61		
10. My ethnic group doesn't have the same opportunities as other ethnic groups.		0.70		
11. I have a strong sense of myself as a member of my ethnic group.		0.73		

Factor Loadings				
Items	Ethnic Group Importance	Ethnic Affiliation	Ethnic Identity	Sense of Ethnic Influence
12. I think friendships work best when people are from the same ethnic group.		0.73		
13. I think of myself as a typical American.		0.60		
14. It's easier to trust people from my own ethnic group.			0.70	
15. I often have to defend my ethnic group from criticism by other people.			0.75	
16. Discrimination against my ethnic group is not a problem. *(R)*			0.50	
17. I want my close friends to be from my own ethnic group.			0.66	
18. My ethnic group is often criticized.			0.67	
19. I believe it's important to take part in holidays that celebrate my ethnic group.			0.80	
20. The opinions of people from my ethnic group are treated as less important than those of other ethnic groups.			0.73	
21. Ethnicity plays a very little part in my family life. *(R)*			0.56	
22. I understand how to get along in mainstream American culture.			0.74	
23. I have been discriminated against because of my ethnicity.			0.66	
24. I take time to learn about the history of my ethnic group.			0.82	
25. The term "American" does not fit me. *(R)*			0.54	
26. I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs.			0.74	
27. I believe my sense of ethnicity is strongly influenced by my parents.				0.73
28. Being a member of my ethnic group is an important part of who I am.				0.87
29. My parents give me a strong sense of cultural values.				0.84

Table 18.
Firth's Penalized Logistic Regression of Past Year Use on Ethnic Experience.

Note: OR = odds ratio; SE = standard error; b = unstandardized regression coefficient; *(R)* = Item was reverse coded; Ethnic Experience latent variable was on a 1 – 4 scale with higher scores indicating increased positive experience with ethnic group; **p*-value < 0.05; *n* = 3,703. Penalized estimates reported in this model were conducted in RStudio while factor loadings were obtained from the measurement model run in Mplus.

Likelihood of Initiation		OR	SE	*p*-value
Direct Effect	Ethnic Group Importance	**0.85***	0.27	0.03
	Ethnic Affiliation	**0.23***	0.63	0.02
	Ethnic Identity	**0.18***	0.49	<0.01
	Sense of Ethnic Influence	**0.02***	0.56	<0.01

Factor Loadings				
Items	Ethnic Group Importance	Ethnic Affiliation	Ethnic Identity	Sense of Ethnic Influence
1. Holidays related to my ethnicity are important to me.	0.82			
2. My ethnic group is respected.	0.81			
3. My ethnic group is treated well.	0.78			
4. Ethnicity is important to my parents.	0.85			
5. In groups, I feel most comfortable if most people there belong to my ethnic group.	0.85			
6. I feel like I belong to mainstream American culture.	0.74			
7. My ethnic group plays a big role in how I live my life.	0.85			
8. I don't think it's necessary to learn about the history of my ethnic group. *(R)*		0.37		
9. Ethnic pride is not very important to a child's upbringing. *(R)*		0.41		
10. My ethnic group doesn't have the same opportunities as other ethnic groups.		0.63		
11. I have a strong sense of myself as a member of my ethnic group.		0.89		
12. I think friendships work best when people are from the same ethnic group.		0.82		
13. I think of myself as a typical American.		0.59		

Factor Loadings				
Items	Ethnic Group Importance	Ethnic Affiliation	Ethnic Identity	Sense of Ethnic Influence
14. It's easier to trust people from my own ethnic group.			0.74	
15. I often have to defend my ethnic group from criticism by other people.			0.76	
16. Discrimination against my ethnic group is not a problem. *(R)*			0.53	
17. I want my close friends to be from my own ethnic group.			0.70	
18. My ethnic group is often criticized.			0.66	
19. I believe it's important to take part in holidays that celebrate my ethnic group.			0.78	
20. The opinions of people from my ethnic group are treated as less important than those of other ethnic groups.			0.72	
21. Ethnicity plays a very little part in my family life. *(R)*			0.56	
22. I understand how to get along in mainstream American culture.			0.75	
23. I have been discriminated against because of my ethnicity.			0.62	
24. I take time to learn about the history of my ethnic group.			0.80	
25. The term "American" does not fit me. *(R)*			0.51	
26. I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs.			0.72	
27. I believe my sense of ethnicity is strongly influenced by my parents.				0.75
28. Being a member of my ethnic group is an important part of who I am.				0.85
29. My parents give me a strong sense of cultural values.				0.83

DISCUSSION

AI adolescents exhibit higher rates of methamphetamine use compared to their non-AI peers. Understanding protective factors related to methamphetamine use is critical due to the association methamphetamine use has with elevated risks of morbidity and various adverse long-term effects, emphasizing the urgency of NIDA director Dr. Nora Volkow's (2022) call to action. There is limited exploration into regional and identity-based disparities in methamphetamine use, with existing research primarily focusing on risk factors contributing to higher levels of us (Ferguson, 2006; Jones, 2009; Moran & Bussey, 2007; Petoskey et al., 1998; Spear et al., 2005; Stanley et al., 2014). The current study sought to explore these intersections and protective factors that increase prevention among adolescents through two primary aims: Aim 1 was designed with an epidemiology focus to characterize methamphetamine use (in the past year and age of initiation) across the intersections including region, ethnicity, grade, and sex. Aim 2 was designed with an etiology focus to identify protective factors for AI adolescents that increase the likelihood of not using methamphetamine and having an older age of initiation. Findings for each aim will be discussed in detail, followed by implications for prevention, strengths of the current study, limitations, and future directions.

Summary: Aim 1

Research indicates notable distinctions in substance use patterns among adolescents based on their school region and various demographic identities such as sex and grade (Bowleg, 2013; Ferguson, 2006; Jones, 2009; Jones & McEwen, 2000; Mereish & Bradford, 2014). However, literature is scarce on the prevalence of adolescent methamphetamine use within these demographic groups, especially in the context of AI adolescents. Examining the intersections is

essential for understanding increased methamphetamine use and can identify groups of adolescents that are most at risk. This study aimed to delineate the details of intersections and pinpoint which intersections are associated with more prominent methamphetamine use over the past year and an earlier age of initiation.

The weighted means from the proportion of each intersection was created to assess methamphetamine use in the past year and age of initiation, as presented in Table 3, Figure 3, and Figure 4. The weighted means from these proportions provided an indication of precision for those estimates that allowed for comparisons of intersections and accounted for the number of participants in each intersecting group (Cumming, 2012). This produced 84 intersections whose means were weighted based on the proportion to the total sample. There were no significant patterns of differences between regions, grades, or sex, counter to hypotheses 1-3. Although research on substance use broadly suggested differences in use, with youth in the Northern Plains using more in the past year compared to Southwest Plains (Whitesell et al., 2007), males using more frequently than females (Centers for Disease Control and Prevention, 2006; Eaton et al., 2006; Wallace et al., 2003), and high schoolers using more than middle schoolers (Johnston et al., 2011), these differences did not exist between intersections for methamphetamine use in this study. This inconsistency with past literature is likely because general conclusions based on other substances generalize poorly to methamphetamine use (Center for Disease Control and Prevention, 2006; Eaton et al., 2006; Johnston et al., 2011; Wallace et al., 2003; Whitesell et al., 2007). Additionally, methamphetamine use occurred in 3.7% of the total sample for AI adolescents which is a relatively rare event compared to alcohol, tobacco, and cannabis use. This creates a small sample of youth who endorse methamphetamine use within a large sampling frame broken down into different intersecting groups, making it challenging to recognize use

patterns between these groups. This challenge could further explain the discrepancy between this study's results and prior research. Based on these results, hypotheses 1-3 were not supported in this study.

I identified two intersections that were at risk for increased methamphetamine use: 1) adolescents who identified as male, in middle school, as AI and another ethnicity (AI-multi-ethnic), and lived in the Northeast region, and 2) adolescents who identified as male, in high school, as AI and another ethnicity (AI-multi-ethnic), and were in the Southern Great Plains region. Both these intersections reported significantly higher use in the past year and an earlier age of initiation compared to the rest of the sample. This suggests that adolescents with these specific intersections may have an increased risk for methamphetamine use. These two groups were identified as outliers for use within the data using three standard deviations away from the mean. No other groups were found to be significant, even when using two standard deviations.

This finding can indicate schools, programs, and AI communities in these regions should give more caution to adolescents with these intersections. More specifically, these results indicate the importance of being mindful of how these specific intersections may be associated with earlier initiation of methamphetamine use and higher rates of use in the past year. As research suggests, males are at a higher risk for using methamphetamines at a lower age and they have a higher frequency of use when compared to females (Brown, 2010; Coughlin et al., 2021). Additionally, research has found that people who identify as AI and at least one other ethnicity are just as likely to use illicit substances as AI only individuals and are often included together in analyses (Eitle & Eitle, 2013; Coughlin et al., 2021; Freese et al., 2000; Keidrowski & Selya, 2019). Applying this research with the findings of the current study identifies the importance of increasing prevention efforts in the Northeast region for male middle schoolers and the Southern

Great Plains region for male high schoolers as they have the greatest risk for adolescent methamphetamine use.

While it is important to identify these groups with higher levels of use, it is difficult to generalize this finding to the application of prevention efforts more broadly to all regions/schools due to the low number of people in each grouping of intersections. Communities, programs, and schools are encouraged to continue following research recommendations for when to provide prevention resources based on AI substance use research more broadly. Most substance use prevention programs occur in high school (beginning around 14 years old) and provide equal opportunity for male and female students (Das et al., 2016; Griffin & Botvin, 2010). The insights gleaned from this study's findings on protective factors can inform precise suggestions for content inclusion in these resources/programs aimed at enhancing methamphetamine prevention efforts.

Summary: Aim 2

Research predominantly focuses on the risk factors linked to increased substance use among AI youth, often overlooking protective factors that play a crucial role in deterring methamphetamine use and nurturing healthy behaviors, even amidst risks, challenges, and the need for increased resiliency (Borrowsky et al., 1999; Cummins et al., 1999; Hawkins et al., 2004; Jessor et al., 1998; LaFromboise et al., 2006). Studies have identified parental monitoring, positive peer and social influences, positive self-esteem, ethnic pride, and ethnic experience as significant protective factors that positively shape the decisions of AI adolescents, discouraging them from engaging in unwanted or delinquent behaviors (Conant, 2020; Cummins et al., 1999; Griffin & Botvin, 2010; Henson et al., 2017; Herman-Stahl, 2006; LaFromboise et al., 2006; Reilly et al., 2020; Rodriquez et al., 2005). These protective factors have been consistently

linked to lower initiation and frequency of substance use among adolescents when they report higher levels of these factors (Allen et al., 2006; Cummins et al., 1999; Henson et al., 2017; LaFromboise et al., 2006; Mackin et al., 2012; Mmari et al., 2010; Moilanen et al., 2014; Oetting et al., 2000; Pharris et al., 1997; Pu et al., 2013; Whitbeck et al., 2001). This indicates that as AI adolescents report an increase in protective factors, their likelihood of engaging in harmful substance use, such as methamphetamines, diminishes. This study explored the impact the protective factors of parental monitoring, peer and social influences, positive self-esteem, ethnic pride, and ethnic experience had on methamphetamine use in the past year and age of initiation.

Findings from the present study indicated that the protective factor of parental monitoring was significant for parental knowledge, such that AI adolescents were 2.60 times less likely to have initiated methamphetamine use and were 4.17 times more likely to have not used in the past year for each one-unit increase in parental knowledge. This factor was not significantly related to the likelihood of having initiated methamphetamine use. Parental control and child disclosure/parental solicitation were not significant for these methamphetamine outcomes, contrary to the hypotheses made based on past literature. Given the unique characteristics of AI families, including their parenting and communication style, the non-significance of these factors was surprising and contradicted past research on parental monitoring for AI adolescents (Swaim & Stanley, 2022). One possibility for this discrepancy is that parenting structures can differ between Native communities, where extended family members can sometimes become more of the disciplinary role for risky/unwanted behaviors (McKinley et al., 2021; Mmari et al., 2010; Walls et al., 2019). This distinction was not accounted for because the items measured in this study focused solely on the adolescent's parents. Future research could include additional measures of familial monitoring (instead of focusing solely on parents) that assess the

adolescent's perceptions of extended family members in addition to immediate family, which could reveal distinct differences between indigenous and non-indigenous families.

Analysis of the protective factor of positive peer/social influence yielded significant results such that for each one-unit increase in peers using less substances, peers offering to use less, and lower perceived peer pressure led to AI adolescents being 2.20, 1.55, and 1.23 times more likely to have not initiated methamphetamine use, respectively. Additionally, results indicated that a decrease in perceived peer pressure led to an older age of initiation by 0.2 years per one-unit increase. Similar to these findings, for each one-unit increase in less peer substance use, peers offering to use less, and lower perceived peer pressure, AI adolescents were 2.78, 1.92, and 1.43 times more likely to have not used methamphetamine in the past year, respectively. The only factor that did not significantly protect against methamphetamine use was lower peer disapproval of use, which was not significant in either model. This could be due to the way AI adolescents perceive peer disapproval of use to occur within their community or because it does not impact methamphetamine use directly (Henson et al., 2017; Momper et al., 2011; Tingey et al., 2016; Whitesell et al., 2014). There is a lack of research on how AI adolescents perceive peer disapproval of substance use compared to other ethnic groups/communities, which future research could expand upon.

The protective factor of positive self-esteem was significant for methamphetamine use, such that for each one-unit increase in internal self-esteem, AI adolescents were 1.94 times less likely to have initiated use. Additionally, both internal and external self-esteem predicted methamphetamine use in the past year, such that AI adolescents were 3.33 and 1.41 times more likely not to have used for each one-unit increase in internal and external self-esteem, respectively. Self-esteem did not significantly predict the age of methamphetamine use initiation.

These results indicate that internal self-esteem is more protective against methamphetamine use for AI adolescents, while external self-esteem was only protective for use in the past year. This distinction is likely due to the impact of perceiving or misperceiving what peers think or due to adolescents having poor competency (Allen et al., 2006; Cummins et al., 1999; Whitbeck et al., 2001). This finding could also explain why the AI adolescents' peer disapproval of use factor was not significant. It may be that increased self-esteem protects against negative peer views, increasing the significance of this factor (Mackin et al., 2012; Pu et al., 2013).

Ethnic pride did not significantly predict methamphetamine use in the past year or age of initiation. This contradicts past research that discussed the importance of AI adolescents being involved in traditional activities, identifying with their culture, and having a strong sense of pride and connection to their ethnicity (Henson et al., 2017; Reilly et al., 2020). Researchers suggest that there are key factors that contribute to ethnic pride in AI communities, such as cultural knowledge, strong traditions, cultural connectedness, and cultural identity (Barlow et al., 2010; Castro et al., 2007; Forcehimes et al., 2011; Szlemko et al., 2006). The current study used items adapted from the Multigroup Ethnic Identity Measure (Phinney, 1992) and assessed ethnic pride as a broad construct instead of focusing on more specific elements. It may be more meaningful to develop items that target these identified key factors for AI adolescents to better assess if having a higher level of ethnic pride as a construct can protect against methamphetamine use. An example of this could be an item such as: "I feel a strong connection to my culture and traditions" or "My ethnicity is an important part of my identity."

The protective factor of ethnic experience was significant in predicting methamphetamine use in the past year for AI adolescents, such that the likelihood of not having used was 1.18, 4.35, 5.56, and 50 times more for each one-unit increase in group importance, ethnic affiliation,

ethnic identity, and sense of ethnic influence, respectively. These factors were not significant in predicting the age of methamphetamine initiation. These mixed findings are likely due to issues with the psychometric testing, as model fit indices were lower in the ethnic experience domain relative to the other protective factors that were assessed (within the poor range). These items were adapted from the Scale of Ethnic Experience (Malcarne et al., 2006), which was initially formed for other ethnic groups such as African Americans, Caucasian Americans, Filipino Americans, and Mexican Americans. It may be that these items do not measure the same construct for AI adolescents as it does for these other communities, indicating that these results should be interpreted with caution. Upon further exploring the literature for AI communities, research supports including a component of ethnic experience targeted towards engagement in activities associated with one's ethnic group (Allen et al., 2006; Moilanen et al., 2014; Osilla et al., 2007). This could be an area of growth for this study and an area for future research to explore.

It is important to discuss the convergence issues that occurred when modeling ethnic experience on age of initiation, as the censored inflation logistic portion of the model did not converge and therefore could not be assessed. This issue prevented the ability to analyze if ethnic experience predicted the likelihood of being at the censored value and is a limitation to this study. Logistic regression models can struggle to converge with large datasets due to computational limitations or numerical instability. This can lead to issues with separation, multicollinearity, and non-linear relationships of the protective factor variables. This leads to unstable parameter estimates and makes it difficult to analyze the data effectively. Research recommendations to resolve this issue are to increase the sample size and/or drop the

independent variables that are correlated (Asaaf et al., 2019; Bonate, 1999; Dormann et al., 2013).

Implications for Prevention and Intervention

Previous studies investigating the distinct aspects of AI adolescent substance use have significantly influenced both prevention and intervention strategies. Prevention initiatives aim to increase protective factors while mitigating the risk factors, thereby lowering the probability of adolescents engaging in substance use (Cicchetti & Hinshaw, 2002). Interventions are directed more toward individuals that are already involved in substance use and aim to minimize the negative consequences that the youth might face (Cicchetti & Hinshaw, 2002). As discussed earlier, protective factors aim to build resiliency to prevent the initial initiation of use and decrease the likelihood of use, which is how the findings from the current study are applied to the literature base.

Findings from the current study regarding the initiation of methamphetamine use and the likelihood to have not used indicate that protective factors like parental knowledge, positive peer/social influence, self-esteem, and ethnic experience may be most helpful in informing effective prevention programs. Specifically, programs working toward methamphetamine prevention may be most impactful when designed to focus on the adolescent's perceived familial and social support, internal self-esteem, and access to various ethnic-related experiences. Prevention programs can utilize these factors when designing curriculums, particularly those on or near reservations. An expanding area of research indicates that mental wellness initiatives thrive best when crafted collaboratively with indigenous communities, focusing on community-driven methods that prioritize indigenous leadership, knowledge systems, beliefs, and practices (King et al, 2009; Restoule et al., 2016; Venugopal et al., 2021). This approach fosters cultural

safety and yields more effective and enduring results (Venugopal et al., 2021). One program that has taken this initiative with Native-focused peer recovery is Wellbriety, which utilizes sober spiritual leaders in community coalitions to promote sobriety and address multigenerational family challenges stemming from elevated addiction rates within their community (Moore & Coyhis, 2010). Wellbriety trains indigenous leaders to facilitate support groups and promote prevention for substance abuse within their communities. Another program that could implement the findings of this study on methamphetamine use specifically is The Healing of the Canoe Project, which relies on community-based and tribal participatory research (CBPR/TPR) to create prevention programs that merge cognitive-behavioral life skills with culturally rooted teaching, practices, and values that are specific to the tribal community (Donovan et al., 2015). This program targets the prevention of substance use and fosters cultural identity and belonging among tribal youth, which could be applied to methamphetamine use directly.

The current study makes significant contributions to the existing literature as it provided support for protective factors on methamphetamine use directly. Previous research has primarily focused on alcohol use among AI adolescents, highlighting higher rates compared to their non-AI counterparts (Gilchrist et al., 1987; Moran & Bussey, 2007; Petoskey et al., 1998). Given these concerning rates, it is crucial for researchers to pinpoint protective factors within this population. However, existing literature reviews show a notable gap in identifying such factors and emphasize the necessity of exploring the strengths and resilience within AI communities that may deter youth from substance use (Kelley et al., 2018). Historical trauma and discrimination have made resiliency a necessity, not a choice, for indigenous communities, and the role that historical trauma plays in the development of resilience in the community helps to underscore the importance of identifying these protective factors and strengths unique to the AI community.

Some of these strengths are the importance placed on parental knowledge, peer/social influence, self-esteem, and ethnic experience, as described above. Communities, schools, and programs that provide resources for prevention can target these aspects within the AI community to promote these protective factors for AI adolescents and their families. This could, in turn, increase the resiliency that AI adolescents build to prevent initiation of methamphetamine use.

Multiple AI adolescent substance use programs have been criticized due to their ineffectiveness, lack of theoretical foundation, and failure to address community needs (Hurley et al., 2019; Kelley et al., 2018; Richer & Roddy, 2022). This study aimed to address these concerns by offering evidence-based protective factors to increase resiliency for prevention researchers, thus bridging a gap in the existing literature.

Strengths

The main strength of this study is its emphasis on identifying protective factors unique to the AI community for methamphetamine use and the broad applicability of the results, as it was facilitated by a large sample size with diverse participant demographics. Large-scale research involving AI communities is scarce, partly due to researchers mishandling AI data (SAMHSA, 2010). Additionally, research has been criticized for disproportionately focusing on the perceived weaknesses of AI communities while neglecting their strengths. By conducting psychometric testing of the protective factors of parental monitoring, positive peer/social influence, self-esteem, ethnic pride, and ethnic experience, along with the subscales within an AI sample on methamphetamine use, this study lays critical groundwork for future research to highlight strengths and protective factors that can be promoted/fostered in AI communities. Since many of these factors are already salient in AI communities, future prevention and intervention efforts can

focus on supporting or strengthening these traits instead of introducing new concepts or skills that would require additional resources, training, and engagement.

This study also completed psychometric testing for the various protective factors, validating the use of these scales within an adolescent AI sample. Specifically, the Parental Monitoring Short Scale presented by Swaim and Stanley (2022) resulted in excellent model fit for the three-factor model of parental knowledge, parental control, and the combined factor for child disclosure and parental solicitation. The peer/social influence scale adapted from the ADAS measure by Swaim and colleagues (1993) resulted in good model fit for the four-factor model of peer substance use, peer offers to use, peer disapproval of use, and perceived peer pressure. The positive self-esteem scale presented by Haruyama and colleagues (2024) resulted in good model fit for the two-factor model of internal self-esteem and external self-esteem. The ethnic pride scale was created by the Tri-Ethnic Center using items adapted from the Multigroup Ethnic Identity Measure (Phinney, 1992) and had not yet undergone psychometric testing. Results found good model fit for the one-factor model of ethnic pride. The ethnic experience scale used items adapted from the Scale of Ethnic Experience (Malcarne et al., 2006) and resulted in poor model fit for the four-factor model of ethnic group importance, ethnic affiliation, ethnic identity, and sense of ethnic influence. The psychometric testing for this model yielded fit indices that were lower in the ethnic experience domain relative to the other protective factors that were assessed and may not measure the same construct for AI adolescents as it does for other communities, as discussed above. Due to this limitation, results for the protective factor of ethnic experience should be interpreted with caution. Overall, these results from psychometric testing provides empirical support for the use of these factors and their subscales when conducting research with AI populations and is a strength of the current study.

The current study also makes significant contributions to the existing literature as it provided support for parental knowledge, positive peer/social influence, self-esteem, and ethnic experience as protective factors for the age of first using methamphetamines and use in the past year. These findings are supported by a unique sample size (n = 14,769), geographic representation (seven regions across the contiguous United States), and demographic diversity (sex and grade group) of the surveyed adolescents. Such diversity allows for a broader applicability of the findings and addresses common challenges in AI research.

Limitations and Future Directions

It is essential to acknowledge several limitations of this study. First, there was an over-dispersion of zeros in the count data for methamphetamine use, as use is a rare event in adolescents. Specifically, the current study identified only 3.7% of AI adolescents who reported methamphetamine use which is a small subset of the overall sample size. This can lead to issues in analysis that require complex analytical approaches. As discussed in the methods section, this study required a penalized approach in the model to address separation and rare events. While Firth Penalized Likelihood logistic regression is an appropriate method for modeling the hypotheses of this study, it is unable to analyze latent variables in this approach. To overcome this limitation, this study used factor scores exported from Mplus for the latent variables to incorporate the penalized method. To address this limitation, the findings of this study should be reexamined when more effective statistical methodologies resolving this issue with Firth models and latent variables become available.

Although research supports pursuing a Firth Penalized Likelihood logistic regression over solutions for quasi-complete separation, other analytical approaches could be more appropriate to the data, such as Exact or Bayesian logistic regression (Bacaksiz & Selçuk, 2021). The general

idea for Exact logistic regression is to base inferences on exact permutational distributions of the regression parameters of interest and fix the remaining parameters at their observed values to create discrete patterns of covariate values (King & Ryan, 2002). However, this approach has been found to be less effective for analyses that include both continuous and categorical variables (Bacaksiz & Selçuk, 2021; Zorn, 2005). Alternatively, Bayesian logistic regression uses a prior distribution on the unknown parameters and updates this with the likelihood of the data, creating a posterior distribution that can be used for predictions and inferences (Bacaksiz & Selçuk, 2021). These analytical recommendations could be explored to further assess the protective factors on the rare event of methamphetamine use for AI adolescents to determine the replicability of this study. This is a limitation as this study did not aim to assess differing analytical approaches. Future research could explore the analytical strengths of each approach, specifically with this dataset and its uniqueness in representing AI communities.

The present study's scope is also restricted by its sampling frame, which was limited to individuals residing on or near a reservation within the contiguous United States. This sampling criteria (supported by grant number NH/NIDA R01DA003371) excludes numerous indigenous persons, including urban Natives, Alaska Natives, and Native Hawaiians. There is also a systemic exclusion of some indigenous people due to the lack of federal recognition and lack of reservation land. This excludes most California Natives, which comprises a large population of AI adolescents that were not included in this study due to its sampling frame restrictions. Moreover, the sampling criteria for this study required at least 20 students at each school to identify as AI, excluding small schools from the sample. Given that these populations were not included in the sample, caution must be taken when generalizing the results beyond AI adolescents that reside on or near reservations within the contiguous United States, that are

federally recognized with reservation land, and attend sufficiently large schools. While there may be some shared values, over-generalizing these findings is problematic due to indigenous communities' distinct differences and unique factors. For example, research on urban Native adolescents demonstrated a higher prevalence of historical trauma compared to adolescents living on or near reservations, which correlates with increased substance use and reduced protective factors (Wiechelt et al., 2012). Therefore, future research must assess the psychometric validity of each protective factor across different ethnic and regional groups before extrapolating findings to other Native communities.

It is also important to acknowledge that the findings in this study rely on retrospective self-report data, which may have inaccuracies especially when assessing methamphetamine use. Adolescents may misreport such data due to factors like recall bias, the social stigma surrounding methamphetamine use, or the fear of consequences for reporting higher rates of use. Some studies that investigated retrospective recall bias in self-reported data found that adolescents often underreport the frequency of their substance use and overestimate their age of initiation (Collins et al., 1985; Prause et al., 2007; Shillington & Clapp, 2000). Although this study emphasized confidentiality and obtained data using the sampling frame discussed in the methods section to reduce the significance of this impact, it is a limitation to researching illicit substance use among adolescents.

Another limitation of this study is the low number of people in each intersecting group, especially those who reported having used methamphetamines. A low sample size for each group of intersections can significantly impact understanding how each group differs in the variable of interest, from ethnicity and sex to grade group and region. When examining these intersections, a small grouping size can obscure the nuances and complexities within each group, leading to

generalized and potentially misleading conclusions. For instance, in studies focusing on race and sex, low sample sizes might overlook the unique experience of subgroups within larger racial or sex categories, perpetuating stereotypes and erasing individual identities. This can also diminish the diverse range of experiences and needs among different intersections, limiting the current study. Addressing the issue of low sample size for each intersection is crucial for fostering a more inclusive and accurate understanding of the complexities of intersectionality and should be explored in future research. Additionally, future research could include other marginalized intersections such as ability, sexual orientation, immigration status, and other axes of oppression that minority groups such as AI communities experience, as recommended by Evans (2022). A more comprehensive engagement with various identities and intersections within AI communities is needed in future work to better understand the trends of harmful substance use over time, such as methamphetamines.

This study also included biological sex in the model and did not include gender identity. One rationale for this approach in substance use research is that there are substantial differences in the metabolism for digesting various substances based on biological sex. However, this limits the potential social influencers and personal experiences for adolescents who identify as non-binary or differently from their biological sex. Additionally, it limits the intersections that can be assessed in this study, as sex was constrained to be binary. Future research could incorporate gender identity and other factors (such as masculinity) into the models to further explore how various protective factors impact additional intersections on substance use. Findings from this study should be reviewed with these limitations in mind.

Conclusion

This study explored the intersections of region, ethnicity, sex, and grade for those with increased risk of methamphetamine use in the past year and age of initiation. It also examined the impact of parental monitoring, positive peer/social influence, self-esteem, ethnic pride, and ethnic experience as protective factors against methamphetamine use for AI adolescents. Key findings in this study were that males in middle school who identified as AI-multi-ethnic living in the Northeast region and males in high school who identified as AI-multi-ethnic living in the Southern Great Plains region endorsed significantly more methamphetamine use in the past year with an earlier age of initiation. Additionally, parental knowledge, positive peer/social influence, and internal self-esteem increased the likelihood that AI adolescents have not initiated methamphetamine use. Lastly, parental knowledge, positive peer/social influence, internal and external self-esteem, and ethnic experience factors were significant in increasing the likelihood that AI adolescents did not engage in methamphetamine use in the past year.

Clinically, these findings provide powerful recommendations for programs that target AI adolescent methamphetamine use to prevent initiation further and build resilience. This study highlights the need to foster parental knowledge, positive peer/social influence, self-esteem, and ethnic experience as protective factors. Understanding these factors within the AI community that contribute to positive outcomes for adolescents can help further programs, schools, and communities as prevention strategies implore techniques to maximize effectiveness in reducing overall AI adolescent substance use. With these findings, clinicians and researchers can collaborate with AI communities/programs to advocate for increased focus on the factors within their communities that contribute to the prevention of methamphetamine use initiation.

Empirically, this study expands on the understanding of exploring the intersections and how this can assist in identifying increased risk. Additionally, it may also expand on the current understanding of protective factors on methamphetamine use for AI adolescents and encourage future research to gain a more accurate representation of these variables.

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APPENDIX A

Surveys administered: 1) AP2: Spring 2016, Fall 2016, and Spring 2017, 2) AP-3: Fall 2017 and Spring 2018, and 3) AP-4: Fall 2018, Spring 2019, Fall 2019

Thank you very much for taking this survey.

Your responses will help your school and others like yours make good decisions about what to do about youth substance use. Therefore, it is important that you answer each question as honestly and thoughtfully as possible.

There is NO way for anyone to tell how you answered the questions since your name isn't anywhere on the survey. No one at your school or anyone you know will see your answers.

This study is completely voluntary. If there is a question that you find unacceptable, you may leave it blank.

We hope you will enjoy taking the survey. Thank you very much for being an important part of this project.

To answer a question, simply click on your response. When you have finished answering the question(s) on each page, click the ">>" button at the bottom of the page to move forward.

Q1 **What grade are you in?**

- ❍ 5 (5)
- ❍ 6 (6)
- ❍ 7 (7)
- ❍ 8 (8)
- ❍ 9 (9)
- ❍ 10 (10)
- ❍ 11 (11)
- ❍ 12 (12)

Q2 **How old are you?**

- ❍ 10 (10)
- ❍ 11 (11)
- ❍ 12 (12)
- ❍ 13 (13)
- ❍ 14 (14)
- ❍ 15 (15)
- ❍ 16 (16)
- ❍ 17 (17)
- ❍ 18 (18)
- ❍ 19 (19)
- ❍ 20 (20)
- ❍ 21 or older (21)

Q3 **Sex:**

- ❍ Male (1)
- ❍ Female (2)

Q4 **Are you... (Mark all that apply.)**
[version AP2 format]

- ❑ White (Q4_1)
- ❑ Black or African American (Q4_2)
- ❑ American Indian/Native American (Q4_3)
- ❑ Latino or Hispanic (Q4_4)
- ❑ Alaska Native (Q4_5)
- ❑ Hawaiian or Pacific Islander (Q4_6)
- ❑ Asian American (Q4_7)
- ❑ Other (Q4_8)

Q4 **Are you...**
[version AP3, AP4 format]
Please answer for each group.

	No (0)	Yes (1)
White (Q4_1)	❍	❍
Black or African American (Q4_2)	❍	❍
American Indian/Native American (Q4_3)	❍	❍
Latino or Hispanic (Q4_4)	❍	❍
Alaska Native (Q4_5)	❍	❍
Hawaiian or Pacific Islander (Q4_6)	❍	❍
Asian American (Q4_7)	❍	❍
Other (Q4_8)	❍	❍

Q5 **Do you have your own cell phone?**
[version AP2 only]

- ❍ Yes (1)
- ❍ No (0)

Q6 **How do you use your phone? (Mark all that apply.)**
[version AP2 only]

- ❑ Phone calls (Q6_1)
- ❑ Texting (Q6_2)
- ❑ Internet (Q6_3)
- ❑ Games (Q6_4)

Q7 **Do you have internet access at home?**
[version AP2 only]

- ❍ Yes (1)
- ❍ No (0)

Q8 **How often do you use the following social media?**
[version AP2, AP3]

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)
Facebook (Q8_1)	❍	❍	❍	❍
Instagram (Q8_2)	❍	❍	❍	❍
Twitter (Q8_3)	❍	❍	❍	❍
Snapchat (Q8_4)	❍	❍	❍	❍

A5 **How much are you like this:** ***Once I start something I want to do, I really want to finish it.***
[version AP3, AP4]

- ❍ Exactly like me (1)
- ❍ Pretty much like me (2)
- ❍ Somewhat like me (3)
- ❍ A little like me (4)
- ❍ Not at all like me (5)

A6 **How much are you like this:** ***If it is my responsibility to do something, I do it.***
[version AP3, AP4]

- ❍ Exactly like me (1)
- ❍ Pretty much like me (2)
- ❍ Somewhat like me (3)
- ❍ A little like me (4)
- ❍ Not at all like me (5)

A7 **How fast do you READ?**
[version AP3, AP4]

- ❍ Very fast (1)
- ❍ Fast (2)
- ❍ Moderately fast (3)
- ❍ A little slow (4)
- ❍ Slow (5)

A8 **What grades do you usually get in school?**
[version AP3, AP4]

- ❍ Mostly A's (1)
- ❍ A's and B's (2)
- ❍ Mostly B's (3)
- ❍ B's and C's (4)
- ❍ Mostly C's (5)
- ❍ C's and D's (6)
- ❍ Mostly D's (7)
- ❍ D's and F's (8)
- ❍ Mostly F's (9)

Q9 **Which of the following live in the same household with you? (Mark all that apply.)**
[version AP2 only format]

- ❑ Father (Q9_1)
- ❑ Stepfather (Q9_2)
- ❑ Mother (Q9_3)
- ❑ Stepmother (Q9_4)
- ❑ Brother (or stepbrother)/ Sister (or stepsister) (Q9_5)
- ❑ Grandparent (Q9_6)
- ❑ Other (Q9_7)

Q9 **Do the following live in the same household with you?**
[version AP3, AP4 format]

	No (0)	Yes (1)
Father (Q9_1)	❍	❍
Stepfather (Q9_2)	❍	❍
Mother (Q9_3)	❍	❍
Stepmother (Q9_4)	❍	❍
Brother (or stepbrother)/ Sister (or stepsister) (Q9_5)	❍	❍
Grandparent (Q9_6)	❍	❍
Other (Q9_7)	❍	❍

Q10 **Which of the following best describes where you live?**

- ❍ On a reservation (1)
- ❍ 1-10 miles from a reservation (2)
- ❍ 11-25 miles from a reservation (3)
- ❍ More than 25 miles from a reservation (4)

A12 **How likely is it that next year you will be in this school (or in the next higher school in this school system)? [version AP3, AP4]**

- ❍ Extremely likely (1)
- ❍ Likely (2)
- ❍ Somewhat likely (3)
- ❍ A little likely (4)
- ❍ Not at all likely (5)

A13 **Since first grade, how many times have you changed schools because your family moved or because of some other family reason? Do NOT count times you changed schools just because you went to the next grade, like when you went from elementary to middle school or middle to high school. [version AP3, AP4]**

- ❍ 0 times – I have not changed schools. (1)
- ❍ 1 time (2)
- ❍ 2 times (3)
- ❍ 3 times (4)
- ❍ 4 or more times (5)

Q11 **Have you EVER smoked CIGARETTES?**

- ❍ Never (1)
- ❍ Once or twice (2)
- ❍ Occasionally but not regularly (3)
- ❍ Regularly in the past (4)
- ❍ Regularly now (5)

Q12 **During the PAST 30 DAYS about how many CIGARETTES have you smoked PER DAY?**
[version AP2 only]

- ❍ None (1)
- ❍ Less than 1 per day (2)
- ❍ 1 to 2 per day (3)
- ❍ 3 to 7 per day (4)
- ❍ 8 to 12 per day (5)
- ❍ 13 to 17 per day (6)
- ❍ 18 to 22 per day (7)
- ❍ 23 to 27 per day (8)
- ❍ 28 to 32 per day (9)
- ❍ 33 to 37 per day (10)
- ❍ 38 or more per day (11)

A15 **How much have you smoked CIGARETTES …DURING THE LAST 30 DAYS?**
[version AP3, AP4]

- ❍ Not at all (1)
- ❍ Less than 1 cigarette per day (2)
- ❍ 1 to 5 cigarettes per day (3)
- ❍ About one-half pack per day (4)
- ❍ About 1 pack per day (5)
- ❍ About one and one-half packs per day (6)
- ❍ 2 packs or more per day (7)

Q13 **Do you think you will be smoking CIGARETTES five years from now?**

- ❍ I definitely will. (1)
- ❍ I probably will. (2)
- ❍ I probably will not. (3)
- ❍ I definitely will not. (4)

A17 **Have you ever taken or used SMOKELESS TOBACCO ("chewing tobacco", "snuff", "plug", "dipping tobacco", "snus", "dissolvable tobacco")…IN YOUR LIFETIME? [version AP3, AP4]**

- ❍ Never (1)
- ❍ Once or twice (2)
- ❍ Occasionally but not regularly (3)
- ❍ Regularly in the past (4)
- ❍ Regularly now (5)

A18 **How often have you taken or used SMOKELESS TOBACCO ("chewing tobacco", "snuff", "plug", "dipping tobacco", "snus", "dissolvable tobacco") …DURING THE LAST 30 DAYS?**
[version AP3, AP4]

- ❍ Not at all (1)
- ❍ Once or twice (2)
- ❍ Once or twice a week (3)
- ❍ 3 to 5 times per week (4)
- ❍ About once a day (5)
- ❍ More than once a day (6)

The next questions are about ALCOHOL, including beer, wine, liquor, and any other drink that contains alcohol.

Q14 **How many times (if any) have you had any ALCOHOL to drink -- more than just a few sips ... IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q15 **How important are each of the following reasons you DON'T DRINK ALCOHOL? [version AP2 only]**

	Not at all important (1)	Somewhat important (2)	Very Important (3)
My parents don't want me to. (Q15_1)	❍	❍	❍
I am afraid of getting caught. (Q15_2)	❍	❍	❍
I couldn't get or find any. (Q15_3)	❍	❍	❍
It could hurt my grades. (Q15_4)	❍	❍	❍
It could keep me from doing other things I want to do. (Q15_5)	❍	❍	❍
I wouldn't like the feeling. (Q15_6)	❍	❍	❍
It has hurt my family. (Q15_7)	❍	❍	❍
I don't like the taste. (Q15_8)	❍	❍	❍
My friends don't do it. (Q15_9)	❍	❍	❍
It isn't cool. (Q15_10)	❍	❍	❍
It could physically harm or kill me. (Q15_11)	❍	❍	❍
Religious or spiritual reason (Q15_12)	❍	❍	❍

Q16 **How many times (if any) have you had any ALCOHOL to drink -- more than just a few sips ...DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q17 **How many times (if any) have you had any ALCOHOL to drink -- more than just a few sips ...DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q18 **How many times (if any) have you gotten DRUNK ...IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q19 **How many times (if any) have you gotten DRUNK ...DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 time (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q20 **How many times (if any) have you gotten DRUNK ...DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q21 **What are the most important reasons you DRINK ALCOHOL? (Mark all that apply.)**
[version AP2 only]

- ❑ To experiment - to see what it's like. (Q21_1)
- ❑ To relax or relieve tension. (Q21_2)
- ❑ To feel good or get high. (Q21_3)
- ❑ To have a good time with my friends. (Q21_4)
- ❑ To fit in with a group I like. (Q21_5)
- ❑ To get away from my problems or troubles. (Q21_6)
- ❑ Because of boredom, nothing else to do. (Q21_7)
- ❑ Because of anger or frustration. (Q21_8)
- ❑ To get through the day. (Q21_9)
- ❑ To increase the effects of some other drug(s). (Q21_10)

- ❑ To decrease (offset) the effects of some other drug(s). (Q21_11)
- ❑ To get to sleep. (Q21_12)
- ❑ Because it tastes good. (Q21_13)
- ❑ Because I am "hooked" – I feel I have to drink. (Q21_14)

A25 **How important are each of the following reasons you DRINK ALCOHOL? [version AP3 only]**

	Not at all important (1)	Somewhat important (2)	Important (3)	Very Important (4)
To experiment - to see what it's like. (A25_1)	❍	❍	❍	❍
To relax or relieve tension. (A25_2)	❍	❍	❍	❍
To feel good or get high. (A25_3)	❍	❍	❍	❍
To have a good time with my friends. (A25_4)	❍	❍	❍	❍
To fit in with a group I like. (A25_5)	❍	❍	❍	❍
To get away from my problems or troubles. (A25_6)	❍	❍	❍	❍
Because of boredom, nothing else to do. (A25_7)	❍	❍	❍	❍
Because of anger or frustration. (A25_8)	❍	❍	❍	❍
To get through the day. (A25_9)	❍	❍	❍	❍
To increase the effects of some other drug(s). (A25_10)	❍	❍	❍	❍
To decrease (offset) the effects of some other drug(s). (A25_11)	❍	❍	❍	❍
To get to sleep. (A25_12)	❍	❍	❍	❍
Because it tastes good. (A25_13)	❍	❍	❍	❍
Because I am "hooked" – I feel I have to drink. (A25_14)	❍	❍	❍	❍

A26 **How important are each of the following reasons you DON'T DRINK ALCOHOL? [version AP3 only]**

	Not at all important (1)	Somewhat important (2)	Important (3)	Very Important (4)
My parents don't want me to. (A26_1)	❍	❍	❍	❍
I am afraid of getting caught. (A26_2)	❍	❍	❍	❍
I couldn't get or find any. (A26_3)	❍	❍	❍	❍
It could hurt my grades. (A26_4)	❍	❍	❍	❍
It could keep me from doing other things I want to do. (A26_5)	❍	❍	❍	❍
I wouldn't like the feeling. (A26_6)	❍	❍	❍	❍
It has hurt my family. (A26_7)	❍	❍	❍	❍
I don't like the taste. (A26_8)	❍	❍	❍	❍
My friends don't do it. (A26_9)	❍	❍	❍	❍
It isn't cool. (A26_10)	❍	❍	❍	❍
It could physically harm or kill me. (A26_11)	❍	❍	❍	❍
Religious or spiritual reason (A26_12)	❍	❍	❍	❍

B24 **How often did you drink . . .**
[version AP4 only]

	Almost Never/Never (1)	Some of the time (2)	Most of the time (3)	Almost Always (4)
Because you like the feeling? (B24_1)	❍	❍	❍	❍
To fit in with a group you like? (B24_2)	❍	❍	❍	❍
Because it helps you when you feel depressed or nervous? (B24_3)	❍	❍	❍	❍
To get high? (B24_4)	❍	❍	❍	❍
Because it helps you enjoy a party? (B24_5)	❍	❍	❍	❍
So you won't feel left out? (B24_6)	❍	❍	❍	❍
Because it's fun? (B24_7)	❍	❍	❍	❍
To cheer you up when you're in a bad mood? (B24_8)	❍	❍	❍	❍
Because it makes social gatherings more fun? (B24_9)	❍	❍	❍	❍
To forget about your worries or problems? (B24_10)	❍	❍	❍	❍
To be liked? (B24_11)	❍	❍	❍	❍
Because it improves parties and celebrations? (B24_12)	❍	❍	❍	❍

The following question asks about how much you drink when you drink alcohol. For this question, a "drink" means any of the following: A 12-ounce can (or bottle) of beer A 4-ounce glass of wine A 12-ounce bottle (or can) of wine cooler A mixed drink or a shot glass of liquor

Q22 **During the LAST TWO WEEKS, how many times (if any) did you have 5 OR MORE drinks in a row?**

- ❍ None (1)
- ❍ Once (2)
- ❍ Twice (3)
- ❍ 3 to 5 times (4)
- ❍ 6 to 9 times (5)
- ❍ 10 or more times (6)

Q23 **Do you think you will be DRINKING ALCOHOL five years from now?**

- ❍ I definitely will. (1)
- ❍ I probably will. (2)
- ❍ I probably will not. (3)
- ❍ I definitely will not. (4)

Q24 **How many times (if any) have you used MARIJUANA (weed, pot) or HASHISH (hash, hash oil)**
…IN YOUR LIFETIME?

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q25 **How important are each of the following reasons you DON'T USE marijuana? [version AP2 only]**

	Not at all important (1)	Somewhat Important (2)	Very Important (3)
My parents don't want me to. (Q25_1)	❍	❍	❍
I am afraid of getting caught. (Q25_2)	❍	❍	❍
I couldn't get or find any. (Q25_3)	❍	❍	❍
It could hurt my grades. (Q25_4)	❍	❍	❍
It could keep me from doing other things I want to do. (Q25_5)	❍	❍	❍
I wouldn't like the feeling. (Q25_6)	❍	❍	❍
It has hurt my family. (Q25_7)	❍	❍	❍
I don't like to smoke. (Q25_8)	❍	❍	❍
My friends don't do it. (Q25_9)	❍	❍	❍
It isn't cool. (Q25_10)	❍	❍	❍
It could physically harm or kill me. (Q25_11)	❍	❍	❍
Religious or spiritual reasons. (Q25_12)	❍	❍	❍

Q26 **How many times (if any) have you used MARIJUANA (weed, pot) or HASHISH (hash, hash oil) …DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q27 **How many times (if any) have you used MARIJUANA (weed, pot) or HASHISH (hash, hash oil) …DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q28 **What are the most important reasons you use MARIJUANA? (Mark all that apply.) [version AP2 only]**

- ❑ To experiment – to see what it's like. (Q28_1)
- ❑ To relax or relieve tension. (Q28_2)
- ❑ To feel good or get high. (Q28_3)
- ❑ To find deeper insights and understanding. (Q28_4)
- ❑ To have a good time with my friends. (Q28_5)
- ❑ To fit in with a group I like. (Q28_6)
- ❑ To get away from my problems or troubles. (Q28_7)
- ❑ Because of boredom, nothing else to do. (Q28_8)
- ❑ Because of anger or frustration. (Q28_9)
- ❑ To get through the day. (Q28_10)
- ❑ To increase the effects of some other drug(s). (Q28_11)
- ❑ To decrease (offset) the effects of some other drug(s). (Q28_12)
- ❑ Because I am "hooked" – I have to have it. (Q28_13)

B32 **During the LAST 30 DAYS, about how many marijuana cigarettes (joints, reefers) or the equivalent, did you smoke a day, on the average? (If you shared them with other people, count only the amount YOU smoked).**
[version AP4 only]

- ❍ None (1)
- ❍ less than 1 a day (2)
- ❍ 1 a day (3)
- ❍ 2-3 a day (4)
- ❍ 4 or more a day (5)

B33 **Do you know how much marijuana you have used (in ounces) during the LAST 30 DAYS?**
[version AP4 only]

- ❍ don't know (99)
- ❍ none (1)
- ❍ less than ½ ounce (2)
- ❍ about ½ ounce (3)
- ❍ about 1 ounce (4)
- ❍ about 2 ounces (5)
- ❍ 2 or more ounces (6)

Q29 **What methods have you used for using MARIJUANA during the last year? (Mark all that apply.)**
[version AP2 only]

- ❑ Smoking (Q29_1)
- ❑ Eating in food (Q29_2)
- ❑ In a drink (Q29_3)
- ❑ Other (Q29_4)

Q29 **Did you use these methods when using MARIJUANA during the last year?**
[version AP3, AP4]

	No (0)	Yes (1)
Smoking (do not include vaping or vaporizing) (Q29_1)	❍	❍
Eating in food (Q29_2)	❍	❍
In a drink (Q29_3)	❍	❍
Vaping or vaporizing (Q29_5)	❍	❍
Other (Q29_4)	❍	❍

A33 **How important are each of the following reasons you USE MARIJUANA? [version AP3 only]**

	Not at all important (1)	Somewhat important (2)	Important (3)	Very Important (4)
To experiment - to see what it's like. (A33_1)	❍	❍	❍	❍
To relax or relieve tension. (A33_2)	❍	❍	❍	❍
To feel good or get high. (A33_3)	❍	❍	❍	❍
To find deeper insights and understanding. (A33_4)	❍	❍	❍	❍
To have a good time with my friends. (A33_5)	❍	❍	❍	❍
To fit in with a group I like. (A33_6)	❍	❍	❍	❍
To get away from my problems or troubles. (A33_7)	❍	❍	❍	❍
Because of boredom, nothing else to do. (A33_8)	❍	❍	❍	❍
Because of anger or frustration. (A33_9)	❍	❍	❍	❍
To get through the day. (A33_10)	❍	❍	❍	❍
To increase the effects of some other drug(s). (A33_11)	❍	❍	❍	❍
To decrease (offset) the effects of some other drug(s). (A33_12)	❍	❍	❍	❍
Because I am “hooked” – I have to have it. (A33_13)	❍	❍	❍	❍

A34 **How important are each of the following reasons you DON'T USE MARIJUANA? [version AP3 only]**

	Not at all important (1)	Somewhat Important (2)	Important (3)	Very Important (4)
My parents don't want me to. (A34_1)	❍	❍	❍	❍
I am afraid of getting caught. (A34_2)	❍	❍	❍	❍
I couldn't get or find any. (A34_3)	❍	❍	❍	❍
It could hurt my grades. (A34_4)	❍	❍	❍	❍
It could keep me from doing other things I want to do. (A34_5)	❍	❍	❍	❍
I wouldn't like the feeling. (A34_6)	❍	❍	❍	❍
It has hurt my family. (A34_7)	❍	❍	❍	❍
I don't like to smoke. (A34_8)	❍	❍	❍	❍
My friends don't do it. (A34_9)	❍	❍	❍	❍
It isn't cool. (A34_10)	❍	❍	❍	❍
It could physically harm or kill me. (A34_11)	❍	❍	❍	❍
Religious or spiritual reasons. (A34_12)	❍	❍	❍	❍

B30 **How often did you use marijuana . . .**
[version AP4 only]

	Almost never/never (1)	Some of the time (2)	Most of the time (3)	Almost always (4)
Because you like the feeling? (B30_1)	❍	❍	❍	❍
To fit in with a group you like? (B30_2)	❍	❍	❍	❍
Because it helps you when you feel depressed or nervous? (B30_3)	❍	❍	❍	❍
To understand things differently? (B30_4)	❍	❍	❍	❍
To get high? (B30_5)	❍	❍	❍	❍
Because it helps you enjoy a party? (B30_6)	❍	❍	❍	❍
So you won't feel left out? (B30_7)	❍	❍	❍	❍
To expand your awareness? (B30_8)	❍	❍	❍	❍
Because it's fun? (B30_9)	❍	❍	❍	❍
To cheer you up when you're in a bad mood? (B30_10)	❍	❍	❍	❍
Because it makes social gatherings more fun? (B30_11)	❍	❍	❍	❍
To be more open to experiences? (B30_12)	❍	❍	❍	❍
Because it improves parties and celebrations? (B30_13)	❍	❍	❍	❍
To be liked? (B30_14)	❍	❍	❍	❍
To forget about your worries or problems? (B30_15)	❍	❍	❍	❍

Q30 **Do you think you will be using MARIJUANA five years from now?**

- ❍ I definitely will. (1)
- ❍ I probably will. (2)
- ❍ I probably will not. (3)
- ❍ I definitely will not. (4)

B35 **How many times (if any) have you taken "synthetic marijuana" ("K2," "Spice") to get high …DURING THE LAST 12 MONTHS?**
[version AP4 only]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q31 **How many times (if any) have you "SNIFFED" OR "HUFFED" GLUE, GAS, SPRAYS, or anything like that to get high (Do NOT include cocaine.)…IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q32 **How many times (if any) have you "SNIFFED" OR "HUFFED" GLUE, GAS, SPRAYS, or anything like that to get high (Do NOT include cocaine.) …DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q33 **How many times (if any) have you "SNIFFED" OR "HUFFED" GLUE, GAS, SPRAYS, or anything like that to get high (Do NOT include cocaine.) …DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

A39 **How many times (if any) have you taken a NONPRESCRIPTION COUGH or COLD MEDICINE ("robos", "DXM", etc.) <u>to get high</u> …IN YOUR LIFETIME? [version AP3, AP4]**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

A40 **How many times (if any) have you taken a NONPRESCRIPTION COUGH or COLD MEDICINE ("robos", "DXM", etc.) <u>to get high</u> …DURING THE LAST 12 MONTHS? [version AP3, AP4]**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

A41 **How many times (if any) have you taken a NONPRESCRIPTION COUGH or COLD MEDICINE ("robos", "DXM", etc.) <u>to get high</u> …DURING THE LAST 30 DAYS? [version AP3, AP4]**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q34 **How many times (if any) have you taken LSD…IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q35 **How many times (if any) have you taken LSD …DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q36 **How many times (if any) have you taken LSD …DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q37 **Do you think you will be using LSD five years from now?**
[version AP2 only]

- ❍ I definitely will. (1)
- ❍ I probably will. (2)
- ❍ I probably will not. (3)
- ❍ I definitely will not. (4)

Q38 **How many times (if any) have you taken HALLUCINOGENS OTHER THAN LSD ("shrooms", peyote, mescaline, etc. DO NOT include Ecstasy)…IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q39 **How many times (if any) have you taken HALLUCINOGENS OTHER THAN LSD ("shrooms", peyote, mescaline, etc. DO NOT include Ecstasy) …DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q41 **What HALLUCINOGENS OTHER THAN LSD have you taken during the last year? (Mark all that apply.) [version AP2 only - PROBLEM: only one (the last) answer was recorded]**

- ❍ Mescaline (1)
- ❍ Peyote (2)
- ❍ "Shrooms" or Psilocybin (3)
- ❍ PCP (4)
- ❍ Concentrated THC (5)
- ❍ Other (6)
- ❍ Don't know the names of some I have used (7)

Q41 **Did you take these HALLUCINOGENS during the last year? [version AP3, AP4]**

	No (0)	Yes (1)
Mescaline (Q41_1)	❍	❍
Peyote (Q41_2)	❍	❍
"Shrooms" or Psilocybin (Q41_3)	❍	❍
PCP (Q41_4)	❍	❍
Concentrated THC (Q41_5)	❍	❍
Other (Q41_6)	❍	❍
Don't know the names of some I have used (Q41_7)	❍	❍

Q40 **How many times (if any) have you taken HALLUCINOGENS OTHER THAN LSD ("shrooms", peyote, mescaline, etc. DO NOT include Ecstasy) …DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

B49 **How many times (if any) have you taken MDMA ("ecstasy", "Molly") …IN YOUR LIFETIME?**
[version AP4 only]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

B50 **How many times (if any) have you taken MDMA ("ecstasy", "Molly") …IN THE LAST 12 MONTHS?**
[version AP4 only]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

B51 **How many times (if any) have you taken MDMA ("ecstasy", "Molly") …DURING THE LAST 30 DAYS?**
[version AP4 only]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q42 **How many times (if any) have you taken PEYOTE <u>for spiritual or cultural reasons</u> only**
IN YOUR LIFETIME?

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

B53 **How many times (if any) have you taken PEYOTE <u>for spiritual or cultural reasons</u> only IN THE LAST 12 MONTHS? [version AP4 only]**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q43 **How many times (if any) have you taken PEYOTE <u>to get high</u> (NOT for spiritual or cultural reasons) IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

B55 **How many times (if any) have you taken PEYOTE <u>to get high</u> (NOT for spiritual or cultural reasons) IN THE LAST 12 MONTHS? [version AP4 only]**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q44 **How many times (if any) have you taken AMPHETAMINES such as Ritalin, Adderall, Concerta, or Vyvanse on your own – that is without a doctor telling you to take them…IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q45 **How many times (if any) have you taken AMPHETAMINES such as Ritalin, Adderall, Concerta, or Vyvanse on your own – that is without a doctor telling you to take them …DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q46 **How many times (if any) have you taken AMPHETAMINES such as Ritalin, Adderall, Concerta, or Vyvanse on your own – that is without a doctor telling you to take them …DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q47 **Do you think you will be using drugs like Ritalin, Adderall, Concerta, or Vyvanse without a doctor's orders five years from now?**
[version AP2 only]

- ❍ I definitely will. (1)
- ❍ I probably will. (2)
- ❍ I probably will not. (3)
- ❍ I definitely will not. (4)

A54 **How many times (if any) have you taken RITALIN on your own – that is, <u>without a doctor telling you to take it</u> …DURING THE LAST 12 MONTHS?**
[version AP3, AP4]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

A55 **How many times (if any) have you taken ADDERALL on your own – that is, <u>without a doctor telling you to take it</u> …DURING THE LAST 12 MONTHS?**
[version AP3, AP4]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q48 **How many times (if any) have you taken METHAMPHETAMINE (meth, crank, crystal meth, speed) …IN YOUR LIFETIME?**
[version AP2 used CRYSTAL METH (ICE) wording]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q49 **How many times (if any) have you taken METHAMPHETAMINE (meth, crank, crystal meth, speed) …DURING THE LAST 12 MONTHS?**
[version AP2 used CRYSTAL METH (ICE) wording]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q50 **How many times (if any) have you taken METHAMPHETAMINE (meth, crank, crystal meth, speed) …DURING THE LAST 30 DAYS?**
[version AP2 used CRYSTAL METH (ICE) wording]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q51 **Do you think you will be using drugs like METHAMPHETAMINE (meth, crank, crystal meth, speed) five years from now?**
[version AP2 used CRYSTAL METH (ICE) wording]

- ❍ I definitely will. (1)
- ❍ I probably will. (2)
- ❍ I probably will not. (3)
- ❍ I definitely will not. (4)

The next questions are about TRANQUILIZERS, which doctors sometimes prescribe to calm people down, quiet their nerves, or relax their muscles. They include the following drugs: Librium Serax Valium Ativan Xanax Klonopin Som

Q52 **Have you ever taken TRANQUILIZERS because a doctor told you to use them?**

- ❍ No. (0)
- ❍ Yes, but I had already tried them on my own. (1)
- ❍ Yes, and it was the first time I took them. (2)

Q53 **How many times (if any) have you taken TRANQUILIZERS on your own–that is, without a doctor telling you to take them …IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q54 **How many times (if any) have you taken TRANQUILIZERS on your own–that is, without a doctor telling you to take them …DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q55 **How many times (if any) have you taken TRANQUILIZERS on your own–that is, without a doctor telling you to take them …DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q56 **Do you think you will be using TRANQUILIZERS without a doctor's orders five years from now?**
[version AP2 only]

- ❍ I definitely will. (1)
- ❍ I probably will. (2)
- ❍ I probably will not. (3)
- ❍ I definitely will not. (4)

Q57 **How many times (if any) have you taken COCAINE in POWDERED form…IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q58 **How many times (if any) have you taken COCAINE in POWDERED form …DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q59 **How many times (if any) have you taken COCAINE in POWDERED form …DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q60 **How many times (if any) have you taken COCAINE in CRACK or FREEBASE form, that is where you inhaled the fumes from smoking, heating or burning ...IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q61 **How many times (if any) have you taken COCAINE in CRACK or FREEBASE form, that is where you inhaled the fumes from smoking, heating or burning …DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q62 **How many times (if any) have you taken COCAINE in CRACK or FREEBASE form, that is where you inhaled the fumes from smoking, heating or burning …DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q63 **Do you think you will be using COCAINE five years from now?**
[version AP2 only]

- ❍ I definitely will. (1)
- ❍ I probably will. (2)
- ❍ I probably will not. (3)
- ❍ I definitely will not. (4)

Q64 **How many times (if any) have you taken HEROIN…IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q65 **How many times (if any) have you taken HEROIN …DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q66 **How many times (if any) have you taken HEROIN …DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

There are a number of narcotics other than heroin, such as methadone, opium, morphine, codeine, Demerol, Vicodin, OxyContin, and Percocet. These are sometimes prescribed by doctors.

Q67 **How many times (if any) have you taken NARCOTICS OTHER THAN HEROIN on your own–that is, <u>without a doctor telling you to take them</u>…IN YOUR LIFETIME?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q68 **How many times (if any) have you taken NARCOTICS OTHER THAN HEROIN on your own–that is, <u>without a doctor telling you to take them</u> …DURING THE LAST 12 MONTHS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q69 **How many times (if any) have you taken NARCOTICS OTHER THAN HEROIN on your own–that is, <u>without a doctor telling you to take them</u> …DURING THE LAST 30 DAYS?**

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q70 **Do you think you will be using HEROIN or OTHER NARCOTICS without a doctor's orders five years from now?**
[version AP2 only]

- ❍ I definitely will. (1)
- ❍ I probably will. (2)
- ❍ I probably will not. (3)
- ❍ I definitely will not. (4)

A76 **How many times (if any) have you taken OXYCONTIN on your own–that is, <u>without a doctor telling you to take it</u> …DURING THE LAST 12 MONTHS?**
[version AP3, AP4]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

A77 **How many times (if any) have you taken OXYCONTIN on your own–that is, <u>without a doctor telling you to take it</u> …DURING THE LAST 30 DAYS?**
[version AP3, AP4]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

A78 **How many times (if any) have you taken VICODIN on your own–that is, <u>without a doctor telling you to take it</u> …DURING THE LAST 12 MONTHS?**
[version AP3, AP4]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

A79 **How many times (if any) have you taken VICODIN on your own–that is, <u>without a doctor telling you to take it</u> …DURING THE LAST 30 DAYS?**
[version AP3, AP4]

- ❍ 0 times (1)
- ❍ 1-2 times (2)
- ❍ 3-5 times (3)
- ❍ 6-9 times (4)
- ❍ 10-19 times (5)
- ❍ 20-39 times (6)
- ❍ 40 or more times (7)

Q71 **At what age (if ever) did you FIRST do each of the following things? Don't count anything you took because a doctor told you to. (Mark one circle for each line.)**
[Use smokeless tobacco – version AP3, AP4]
[version AP2 used CRYSTAL METH (ICE) wording]

	(1) Never	(7) 7 or	8 (8)	9 (9)	10 (10)	11 (11)	12 (12)	13 (13)	14 (14)	15 (15)	16 (16)	17 (17)	18 (18)	19 or older (19)
Smoke your first cigarette (Q71_1)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Smoke cigarettes on a daily basis (Q71_2)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Use smokeless tobacco (Q71_9)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try alcohol – more than just a few sips (Q71_3)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Get drunk (Q71_4)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try marijuana or hashish (Q71_5)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try crack or powdered cocaine (Q71_6)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try methamphetamine (meth, crank, crystal meth, speed) (Q71_7)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

Q72 **At what age (if ever) did you FIRST do each of the following things? Don't count anything you took because a doctor told you to. (Mark one circle for each line.)**
[These items were version AP2 only]
[These items were version AP3, AP4]

	(1)Never	7 or younger	8	9	10	11	12	13	14	15	16	17	18	19 or older
Try heroin (Q72_1)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try any narcotic other than heroin (Q72_2)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try amphetamines (Q72_3)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try tranquilizers (Q72_4)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try LSD (Q72_5)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try a hallucinogen other than LSD (Q72_6)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try Vicodin or OxyContin (Q72_7)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Try Ritalin or Adderall (Q72_8)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

Q73 **For each of the following drugs, was there ever a time in your life when you tried to quit or reduce your use and had difficulty doing so?**
[These items were version AP2, AP3]
[version AP2 used CRYSTAL METH (ICE) wording]

	Never Used (1)	No (2)	Yes (3)
Cigarettes (Q73_1)	❍	❍	❍
Alcohol (Q73_2)	❍	❍	❍
Marijuana (Q73_3)	❍	❍	❍
Methamphetamine(meth, crank, crystal meth, speed) (Q73_4)	❍	❍	❍
Heroin (Q73_5)	❍	❍	❍
Any other illegal drugs (Q73_6)	❍	❍	❍

B88 **During the LAST FOUR WEEKS, on how many days (if any) were you UNDER THE INFLUENCE OF ALCOHOL while you were at school?**
[version AP4 only]

- ❍ None (1)
- ❍ one day (2)
- ❍ two days (3)
- ❍ 3-5 days (4)
- ❍ 6-9 days (5)
- ❍ 10 or more days (6)

B89 **During the LAST FOUR WEEKS, on how many days (if any) were you UNDER THE INFLUENCE OF MARIJUANA while you were at school?**
[version AP4 only]

- ❍ None (1)
- ❍ one day (2)
- ❍ two days (3)
- ❍ 3-5 days (4)
- ❍ 6-9 days (5)
- ❍ 10 or more days (6)

B90 **During the LAST FOUR WEEKS, on how many days (if any) were you UNDER THE INFLUENCE OF SOME OTHER ILLEGAL DRUG while you were at school?**
[version AP4 only]

- ❍ None (1)
- ❍ one day (2)
- ❍ two days (3)
- ❍ 3-5 days (4)
- ❍ 6-9 days (5)
- ❍ 10 or more days (6)

Q74 **How difficult do you think it would be for you to get each of the following types of drugs, if you wanted some?**
[version AP3, AP4]
[version AP2 used CRYSTAL METH (ICE) wording]

	Can't Say, Drug Unfamiliar (1)	Probably Impossible (2)	Very Difficult (3)	Fairly Difficult (4)	Fairly Easy (5)	Very Easy (6)
Cigarettes (Q74_1)	❍	❍	❍	❍	❍	❍
Smokeless tobacco (Q74_12)	❍	❍	❍	❍	❍	❍
Alcohol (Q74_2)	❍	❍	❍	❍	❍	❍
Marijuana (pot, weed) (Q74_3)	❍	❍	❍	❍	❍	❍
Methamphetamine (meth, crank, crystal meth, speed) (Q74_4)	❍	❍	❍	❍	❍	❍
Heroin (Q74_5)	❍	❍	❍	❍	❍	❍
Some other narcotic (codeine, Vicodin, OxyContin, Percocet, etc.) (Q74_6)	❍	❍	❍	❍	❍	❍
LSD (Q74_7)	❍	❍	❍	❍	❍	❍
Amphetamines (uppers, speed, Adderall, Ritalin, etc.) (Q74_8)	❍	❍	❍	❍	❍	❍
Tranquilizers (Librium, Valium, Xanax, etc.) (Q74_9)	❍	❍	❍	❍	❍	❍
"Crack" cocaine (Q74_10)	❍	❍	❍	❍	❍	❍
Cocaine in powder form (Q74_11)	❍	❍	❍	❍	❍	❍

Q75 **How much do you think people risk harming themselves (physically or in other ways) if they …**
[table on version AP2, AP3]

	No Risk (1)	Slight Risk (2)	Moderate Risk (3)	Great Risk (4)
Smoke 1 to 5 cigarettes per day? (Q75_1)	❍	❍	❍	❍
Smoke one or more packs of cigarettes per day? (Q75_2)	❍	❍	❍	❍
Use smokeless tobacco regularly? (Q75_3)	❍	❍	❍	❍
Use alcohol 1-2 times? (Q75_4)	❍	❍	❍	❍
Use alcohol regularly? (Q75_5)	❍	❍	❍	❍
Get drunk 1-2 times? (Q75_6)	❍	❍	❍	❍
Get drunk regularly? (Q75_7)	❍	❍	❍	❍
Use marijuana 1-2 times? (Q75_8)	❍	❍	❍	❍
Use marijuana regularly? (Q75_9)	❍	❍	❍	❍
Use cocaine or crack 1-2 times? (Q75_10)	❍	❍	❍	❍
Use cocaine or crack regularly? (Q75_11)	❍	❍	❍	❍

Q75 **How much do you think people risk harming themselves (physically or in other ways) if they …**
[table on version AP4]

	No Risk (1)	Slight Risk (2)	Moderate Risk (3)	Great Risk (4)
Smoke 1 to 5 cigarettes per day? (Q75_1)	❍	❍	❍	❍
Smoke one or more packs of cigarettes per day? (Q75_2)	❍	❍	❍	❍
Use smokeless tobacco regularly? (Q75_3)	❍	❍	❍	❍
Try one or two drinks of alcohol? (Q75_4)	❍	❍	❍	❍
Take one or two drinks nearly every day? (Q75_16)	❍	❍	❍	❍
Take four or five drinks nearly every day? (Q75_12)	❍	❍	❍	❍
Have five or more drinks once or twice each weekend? (Q75_13)	❍	❍	❍	❍
Try marijuana once or twice? (Q75_8)	❍	❍	❍	❍
Smoke marijuana occasionally? (Q75_14)	❍	❍	❍	❍
Smoke marijuana regularly? (Q75_9)	❍	❍	❍	❍
Use cocaine or crack once or twice? (Q75_10)	❍	❍	❍	❍
Use cocaine or crack occasionally? (Q75_15)	❍	❍	❍	❍

Q76 **How much do you think people risk harming themselves (physically or in other ways) if they ...**
[table on version AP2, AP3]
[version AP3 used Methamphetamine (meth, crank, crystal meth, speed) wording]

	No Risk (1)	Slight Risk (2)	Moderate Risk (3)	Great Risk (4)
Use heroin 1-2 times? (Q76_1)	❍	❍	❍	❍
Use heroin regularly? (Q76_2)	❍	❍	❍	❍
Use crystal meth (ice) 1-2 times? (Q76_3)	❍	❍	❍	❍
Use crystal meth (ice) regularly? (Q76_4)	❍	❍	❍	❍
Use Adderall (without a doctor's orders) 1-2 times? (Q76_5)	❍	❍	❍	❍
Use Adderall (without a doctor's orders) regularly? (Q76_6)	❍	❍	❍	❍
Use Oxycontin (without a doctor's orders) 1-2 times? (Q76_7)	❍	❍	❍	❍
Use Oxycontin (without a doctor's orders) regularly? (Q76_8)	❍	❍	❍	❍

Q76 **How much do you think people risk harming themselves (physically or in other ways) if they ...**
[table on version AP4]

	No Risk (1)	Slight Risk (2)	Moderate Risk (3)	Great Risk (4)
Try heroin once or twice without a needle? (Q76_13)	❍	❍	❍	❍
Take heroin occasionally without a needle? (Q76_9)	❍	❍	❍	❍
Use Methamphetamine (meth, crank, crystal meth, speed) once or twice? (Q76_3)	❍	❍	❍	❍
Use Methamphetamine (meth, crank, crystal meth, speed) occasionally? (Q76_10)	❍	❍	❍	❍
Use Adderall (without a doctor's orders) once or twice? (Q76_5)	❍	❍	❍	❍
Use Adderall (without a doctor's orders) occasionally? (Q76_11)	❍	❍	❍	❍
Use OxyContin (without a doctor's orders) once or twice? (Q76_7)	❍	❍	❍	❍
Use OxyContin (without a doctor's orders) occasionally? (Q76_12)	❍	❍	❍	❍

Q77 **How many of your friends...**
[version AP3, AP4]

	None (1)	One or Two (2)	Some of Them (3)	Most of Them (4)
Drink alcohol? (Q77_1)	❍	❍	❍	❍
Get drunk? (Q77_2)	❍	❍	❍	❍
Smoke cigarettes? (Q77_3)	❍	❍	❍	❍
Use smokeless tobacco? (Q77_6)	❍	❍	❍	❍
Use marijuana? (Q77_4)	❍	❍	❍	❍
Use other illegal drugs? (Q77_5)	❍	❍	❍	❍

Q78 **How often have your friends asked you to ...**
[version AP3, AP4]

	Not at All (1)	Not Much (2)	Some (3)	A lot (4)
Drink alcohol? (Q78_1)	❍	❍	❍	❍
Get drunk? (Q78_2)	❍	❍	❍	❍
Smoke cigarettes? (Q78_3)	❍	❍	❍	❍
Use smokeless tobacco? (Q78_6)	❍	❍	❍	❍
Use marijuana? (Q78_4)	❍	❍	❍	❍
Use other illegal drugs? (Q78_5)	❍	❍	❍	❍

Q79 **How much would your friends try to stop you from ...**
[version AP3, AP4]

	Not at All (1)	Not Much (2)	Some (3)	A lot (4)
Drinking alcohol? (Q79_1)	❍	❍	❍	❍
Getting drunk? (Q79_2)	❍	❍	❍	❍
Smoking cigarettes? (Q79_3)	❍	❍	❍	❍
Using smokeless tobacco? (Q79_6)	❍	❍	❍	❍
Using marijuana? (Q79_4)	❍	❍	❍	❍
Using other illegal drugs? (Q79_5)	❍	❍	❍	❍

Q80 **How much pressure do you feel from your friends and schoolmates to ...**
[version AP3, AP4]

	None (1)	A little (2)	Some (3)	A Lot (4)
Drink alcohol? (Q80_1)	❍	❍	❍	❍
Get drunk? (Q80_2)	❍	❍	❍	❍
Smoke cigarettes? (Q80_3)	❍	❍	❍	❍
Use smokeless tobacco? (Q80_6)	❍	❍	❍	❍
Use marijuana? (Q80_4)	❍	❍	❍	❍
Use other illegal drugs? (Q80_5)	❍	❍	❍	❍

Q81 **Think about the past year in school, how often did you...**

	Never (1)	Not Often (2)	Sometimes (3)	Almost Always (4)
Enjoy being in school? (Q81_1)	❍	❍	❍	❍
Hate being in school? (Q81_2)	❍	❍	❍	❍
Look forward to going to school? (Q81_3)	❍	❍	❍	❍
Try to do your best work in school? (Q81_4)	❍	❍	❍	❍
Find your school work interesting? (Q81_5)	❍	❍	❍	❍

Q82 **How true are these statements?**
[version AP2, AP3]
[version AP4]

	Not at all (1)	Not Much (2)	Some (3)	A lot (4)
I feel safe at school. (Q82_1)	❍	❍	❍	❍
I feel safe going to school. (Q82_2)	❍	❍	❍	❍
I feel safe when I leave school. (Q82_3)	❍	❍	❍	❍
I feel safe where I live. (Q82_4)	❍	❍	❍	❍
I feel bullied at school. (Q82_5)	❍	❍	❍	❍
I feel bullied online. (Q82_6)	❍	❍	❍	❍

Q83 **How likely is it that you will do each of the following things?**

	Definitely Won't (1)	Probably Won't (2)	Probably Will (3)	Definitely Will (4)
Graduate from high school. (Q83_1)	❍	❍	❍	❍
Go to a technical or vocational school after high school. (Q83_2)	❍	❍	❍	❍
Go to college. (Q83_3)	❍	❍	❍	❍
Graduate from college (four-year program). (Q83_4)	❍	❍	❍	❍
Serve in the armed forces. (Q83_5)	❍	❍	❍	❍

The next seven questions are about religion and spirituality.
[version AP2, AP3]

Q84 **The next three questions are about religion. What is your religious preference?**

- ❍ Native American Church (1)
- ❍ Traditional Native American Spirituality (2)
- ❍ Protestant (Baptist, Methodist, Presbyterian, etc.) (3)
- ❍ Catholic (4)
- ❍ Mormon (Latter-Day Saints) (5)
- ❍ Other Religion (6)
- ❍ None (7)

Q84 **What is your religious preference?**
[version AP4 only]

	No (0)	Yes (1)
Native American Church (Q84_1)	❍	❍
Traditional Native American Spirituality (Q84_2)	❍	❍
Protestant (Baptist, Methodist, Presbyterian, etc.) (Q84_3)	❍	❍
Catholic (Q84_4)	❍	❍
Mormon (Latter-Day Saints) (Q84_5)	❍	❍
Other Religion (Q84_6)	❍	❍
None (Q84_7)	❍	❍

Q85 **How often do you attend religious services?**

- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Once or twice a month (3)
- ❍ About once a week or more (4)

Q86 **How important is religion in your life?**

- ❍ Not important (1)
- ❍ A little important (2)
- ❍ Pretty important (3)
- ❍ Very important (4)

B104 **How important is being spiritual to you?**
[version AP4 only]

- ❍ Not important (1)
- ❍ A little important (2)
- ❍ Pretty important (3)
- ❍ Very important (4)

B105 **How important is it for you to follow traditional Indian beliefs?**
[version AP4 only]

- ❍ Not important (1)
- ❍ A little important (2)
- ❍ Pretty important (3)
- ❍ Very important (4)

B106 **How important is it for you to follow Christian beliefs?**
[version AP4 only]

- ❍ Not important (1)
- ❍ A little important (2)
- ❍ Pretty important (3)
- ❍ Very important (4)

B107 **How important is it for you to follow other religious or spiritual beliefs?**
[version AP4 only]

- ❍ Not important (1)
- ❍ A little important (2)
- ❍ Pretty important (3)
- ❍ Very important (4)

Q87 **The following questions are about your parents (or stepparents or guardians):**

	Never (1)	Rarely (2)	Sometimes (3)	Most of the time (4)	Always (5)
My parents know where I am after school. (Q87_1)	❍	❍	❍	❍	❍
When I go out at night, my parents know who I am with. (Q87_2)	❍	❍	❍	❍	❍
When I go out at night, my parents know where I am. (Q87_3)	❍	❍	❍	❍	❍
When I go out on weekend nights, I have to be home by a set time. (Q87_4)	❍	❍	❍	❍	❍

B109 **The following questions are about your parents (or stepparents or guardians): [version AP4 only]**

	Never (1)	Rarely (2)	Sometimes (3)	Most of the time (4)	Always (5)
I tell my parents how I'm doing in school. (B109_1)	❍	❍	❍	❍	❍
I have to tell my parents who I'm with and what I'm doing at night with friends. (B109_2)	❍	❍	❍	❍	❍
My parents ask what I do in my free time. (B109_3)	❍	❍	❍	❍	❍
I tell my parents about my activities with friends. (B109_4)	❍	❍	❍	❍	❍
I have to tell my parents my plans for weekend nights. (B109_5)	❍	❍	❍	❍	❍
My parents ask about things that happen at school. (B109_6)	❍	❍	❍	❍	❍
I keep secrets from my parents about what I do in my free time. (B109_7)	❍	❍	❍	❍	❍
I need permission to be out late on weeknights. (B109_8)	❍	❍	❍	❍	❍
My parents talk to my friends. (B109_9)	❍	❍	❍	❍	❍

Q88 **How much would your family care if you ... [version AP3, AP4]**

	Not at All (1)	Not Much (2)	Some (3)	A lot (4)
Smoked cigarettes? (Q88_1)	❍	❍	❍	❍
Used smokeless tobacco? (Q88_7)	❍	❍	❍	❍
Drank alcohol? (Q88_2)	❍	❍	❍	❍
Got drunk? (Q88_3)	❍	❍	❍	❍
Sniffed glue, gas, paint, etc? (Q88_4)	❍	❍	❍	❍
Used marijuana? (Q88_5)	❍	❍	❍	❍
Used other illegal drugs? (Q88_6)	❍	❍	❍	❍

Q89 **How much does your family care about you?**
[version AP2, AP3]

- ❍ Not at All (1)
- ❍ Not Much (2)
- ❍ Some (3)
- ❍ A lot (40

Q90 **The following questions ask about you.**
[version AP2, AP3]

	Not at All (1)	Not Much (2)	Some (3)	A lot (4)
I am proud of myself. (Q90_1)	❍	❍	❍	❍
I am quick tempered. (Q90_2)	❍	❍	❍	❍
I feel low. (Q90_3)	❍	❍	❍	❍
I am able to do things well. (Q90_4)	❍	❍	❍	❍
I like myself. (Q90_5)	❍	❍	❍	❍

Q91 **The following questions ask about you.**
[version AP2, AP3]

	Not at All (1)	Not Much (2)	Some (3)	A lot (4)
I get mad. (Q91_1)	❍	❍	❍	❍
I am unhappy. (Q91_2)	❍	❍	❍	❍
Other people my age like me. (Q91_3)	❍	❍	❍	❍
I am lucky. (Q91_4)	❍	❍	❍	❍
I do things my teachers don't want me to do. (Q91_5)	❍	❍	❍	❍

Q92 **The following questions ask about you.**
[version AP2, AP3]

	Not at All (1)	Not Much (2)	Some (3)	A lot (4)
I am lonely. (Q92_1)	❍	❍	❍	❍
I feel like hitting someone. (Q92_2)	❍	❍	❍	❍
I feel bad. (Q92_3)	❍	❍	❍	❍
Other people my age like to be with me. (Q92_4)	❍	❍	❍	❍
People like me. (Q92_5)	❍	❍	❍	❍

Q93 **The following questions ask about you.**
[version AP2, AP3]

	Not at All (1)	Not Much (2)	Some (3)	A lot (4)
I like to do dangerous things. (Q93_1)	❍	❍	❍	❍
I lose my temper. (Q93_2)	❍	❍	❍	❍
I feel sad. (Q93_3)	❍	❍	❍	❍
I am good looking. (Q93_4)	❍	❍	❍	❍
I take chances. (Q93_5)	❍	❍	❍	❍

Q94 **The following questions ask about you.**
[version AP2, AP3]

	Not at All (1)	Not Much (2)	Some (3)	A lot (4)
I am smart. (Q94_1)	❍	❍	❍	❍
I am lonesome. (Q94_2)	❍	❍	❍	❍
I am hotheaded. (Q94_3)	❍	❍	❍	❍
I would like to learn to skydive. (Q94_4)	❍	❍	❍	❍
I am depressed. (Q94_5)	❍	❍	❍	❍

Q95 **The following questions ask about you.**
[version AP2, AP3]

	Not at All (1)	Not Much (2)	Some (3)	A lot (4)
I am good at games. (Q95_1)	❍	❍	❍	❍
I get angry. (Q95_2)	❍	❍	❍	❍
Other people my age ask me to do things with them. (Q95_3)	❍	❍	❍	❍

B117 **The next questions ask about how you tend to think and act.**
[version AP4 only]

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
I generally like to see things through to the end. (B117_1)	❍	❍	❍	❍
I think carefully about things. (B117_2)	❍	❍	❍	❍
When I am very happy, I tend to do things that could cause me problems. (B117_3)	❍	❍	❍	❍
Unfinished jobs really bother me. (B117_4)	❍	❍	❍	❍
I tend to stop and think before doing things. (B117_5)	❍	❍	❍	❍
When I feel bad, I often do things I later regret in order to make myself feel better now. (B117_6)	❍	❍	❍	❍
Once I get going on something, I hate to stop. (B117_7)	❍	❍	❍	❍

B118 **The next questions ask about how you tend to think and act.**
[version AP4 only]

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
Sometimes when I feel bad, I keep doing something even though it is making me feel worse. (B118_1)	❍	❍	❍	❍
I like taking risks. (B118_2)	❍	❍	❍	❍
I tend to lose control when I'm in a great mood. (B118_3)	❍	❍	❍	❍
I finish what I start. (B118_4)	❍	❍	❍	❍
When I am upset, I often act without thinking. (B118_5)	❍	❍	❍	❍
I like new and exciting experiences and sensations, even if they are a little frightening. (B118_6)	❍	❍	❍	❍

B119 **The next questions ask about how you tend to think and act.**
[version AP4 only]

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
When I feel rejected, I often say things I later regret. (B119_1)	❍	❍	❍	❍
I would like to learn to fly an airplane. (B119_2)	❍	❍	❍	❍
I usually think carefully before doing anything. (B119_3)	❍	❍	❍	❍
I tend to act without thinking when I get really excited. (B119_4)	❍	❍	❍	❍
I would like the feeling of skiing very fast down a high mountain slope. (B119_5)	❍	❍	❍	❍
Other people are shocked about the things I do when I am feeling very excited. (B119_6)	❍	❍	❍	❍

B120 **The next questions ask how you feel about your ethnic/cultural group.**
[version AP4 only]

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
Holidays related to my ethnicity are important to me. (B120_1)	❍	❍	❍	❍
My ethnic group is respected. (B120_2)	❍	❍	❍	❍
My ethnic group is treated well. (B120_3)	❍	❍	❍	❍
Ethnicity is important to my parents. (B120_4)	❍	❍	❍	❍
In groups, I feel most comfortable if most people there belong to my ethnic group. (B120_5)	❍	❍	❍	❍
I feel like I belong to mainstream American culture. (B120_6)	❍	❍	❍	❍
My ethnic group plays a big role in how I live my life. (B120_7)	❍	❍	❍	❍

B121 **The next questions ask how you feel about your ethnic/cultural group. [version AP4 only]**

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
I don't think it's necessary to learn about the history of my ethnic group. (B121_1)	❍	❍	❍	❍
Ethnic pride is not very important to a child's upbringing. (B121_2)	❍	❍	❍	❍
My ethnic group doesn't have the same opportunities as other ethnic groups. (B121_3)	❍	❍	❍	❍
I have a strong sense of myself as a member of my ethnic group. (B121_4)	❍	❍	❍	❍
I think friendships work best when people are from the same ethnic group. (B121_5)	❍	❍	❍	❍
I believe my sense of ethnicity is strongly influenced by my parents. (B121_6)	❍	❍	❍	❍
I think of myself as a typical American. (B121_7)	❍	❍	❍	❍

B122 **The next questions ask how you feel about your ethnic/cultural group. [version AP4 only]**

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
It's easier to trust people from my own ethnic group. (B122_1)	❍	❍	❍	❍
I often have to defend my ethnic group from criticism by other people. (B122_2)	❍	❍	❍	❍
Being a member of my ethnic group is an important part of who I am. (B122_3)	❍	❍	❍	❍
Discrimination against my ethnic group is not a problem. (B122_4)	❍	❍	❍	❍
I want my close friends to be from my own ethnic group. (B122_5)	❍	❍	❍	❍
My parents give me a strong sense of cultural values. (B122_6)	❍	❍	❍	❍
My ethnic group is often criticized. (B122_7)	❍	❍	❍	❍

B123 **The next questions ask how you feel about your ethnic/cultural group. [version AP4 only]**

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
I believe it's important to take part in holidays that celebrate my ethnic group. (B123_1)	❍	❍	❍	❍
The opinions of people from my ethnic group are treated as less important than those of other ethnic groups. (B123_2)	❍	❍	❍	❍
Ethnicity plays a very little part in my family life. (B123_3)	❍	❍	❍	❍
I understand how to get along in mainstream American culture. (B123_4)	❍	❍	❍	❍
I have been discriminated against because of my ethnicity. (B123_5)	❍	❍	❍	❍
I take time to learn about the history of my ethnic group. (B123_6)	❍	❍	❍	❍
The term "American" does not fit me. (B123_7)	❍	❍	❍	❍

B124 **The next questions ask how you feel about your ethnic/cultural group. [version AP4 only]**

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs. (B124_1)	❍	❍	❍	❍
I am active in organizations or groups that include mostly members of my ethnic group. (B124_2)	❍	❍	❍	❍
I think a lot about how my life will be affected by being a part of my ethnic group. (B124_3)	❍	❍	❍	❍
To learn more about my ethnic background, I often talk to other people about my ethnic group. (B124_4)	❍	❍	❍	❍
I participate in cultural practices of my ethnic group, such as special food, music, or customs. (B124_5)	❍	❍	❍	❍

Thank you for taking the time to answer these questions. We hope you found them interesting.

The entire section below was replaced on the AP4 by the above questions B117-B124

Some families have special activities or traditions that take place every year at particular times (such as holiday parties, special meals, religious activities, trips or visits).

Q96 **How many of these special activities or traditions does your family have that are based on ... [version AP2, AP3]**

	None (1)	Not Many (2)	Some (3)	A lot (4)
The American-Indian culture? (Q96_1)	❍	❍	❍	❍
The White-American culture? (Q96_2)	❍	❍	❍	❍
Another culture? (Q96_3)	❍	❍	❍	❍

Q97 **When you are an adult and have your own family, will you do special things together or have special traditions that are based on...**
[version AP2, AP3]

	None (1)	Not Many (2)	Some (3)	A lot (4)
The American-Indian culture? (Q97_1)	❍	❍	❍	❍
The White-American culture? (Q97_2)	❍	❍	❍	❍
Another culture? (Q97_3)	❍	❍	❍	❍

Q98 **Does your family live by or follow...**
[version AP2, AP3]

	No (1)	Not Much (2)	Some (3)	A lot (4)
The American-Indian way of life? (Q98_1)	❍	❍	❍	❍
The White-American way of life? (Q98_2)	❍	❍	❍	❍
Another way of life? (Q98_3)	❍	❍	❍	❍

Q99 **Do YOU live by or follow...**
[version AP2, AP3] – order changed on AP3

	No (1)	Not Much (2)	Some (3)	A lot (4)
The White-American way of life? (Q99_1)	❍	❍	❍	❍
The American-Indian way of life? (Q99_2)	❍	❍	❍	❍
Another way of life? (Q99_3)	❍	❍	❍	❍

Q100 **Is your family a success in...**
[version AP2, AP3] – order changed on AP3

	No (1)	Not Much (2)	Some (3)	A lot (4)
The White-American way of life? (Q100_1)	❍	❍	❍	❍
The American-Indian way of life? (Q100_2)	❍	❍	❍	❍
Another way of life? (Q100_3)	❍	❍	❍	❍

Q101 **When you are an adult, will YOU be a success in...**
[version AP2, AP3]

	No (1)	Not Much (2)	Some (3)	A lot (4)
The American-Indian way of life? (Q101_1)	❍	❍	❍	❍
The White-American way of life? (Q101_2)	❍	❍	❍	❍
Another way of life? (Q101_3)	❍	❍	❍	❍

Q102 **How true are these statements about you?**
[version AP2, AP3]

	Not at all true (1)	A little true (2)	Pretty true (3)	Very true (4)
I am proud to be a member of my ethnic group. (Q102_1)	❍	❍	❍	❍
I try to find out more about the history and traditions of my ethnic group. (Q102_2)	❍	❍	❍	❍
I feel a strong attachment to my ethnic group. (Q102_3)	❍	❍	❍	❍
I have a lot of pride in my ethnic group. (Q102_4)	❍	❍	❍	❍

Q103 **How true are these statements about you?**
[version AP2, AP3]

	Not at all true (1)	A little true (2)	Pretty true (3)	Very true (4)
I feel good about my ethnicity. (Q103_1)	❍	❍	❍	❍
I am happy that I am a member of my ethnic group. (Q103_2)	❍	❍	❍	❍
My ethnic roots give me strength. (Q103_3)	❍	❍	❍	❍
My family does a lot to hold onto our ethnic identity and beliefs. (Q103_4)	❍	❍	❍	❍

Q104 **In the past 12 months...**
[version AP2, AP3]

	Not at All (1)	Not Much (2)	Some (3)	A lot (4)
How often have other kids said something bad or insulting to you because of your race/ethnicity? (Q104_1)	❍	❍	❍	❍
How often has a store owner, sales clerk, or person working at a place of business treated you in a disrespectful way because of your race/ethnicity? (Q104_2)	❍	❍	❍	❍
How often have the police hassled you because of your race/ethnicity? (Q104_3)	❍	❍	❍	❍
How often have other kids ignored you or left you out of some activity because of your race/ethnicity? (Q104_4)	❍	❍	❍	❍
How often have adults suspected you of doing something wrong because of your race/ethnicity? (Q104_5)	❍	❍	❍	❍
How often has someone yelled a racial slur or racial insult at you? (Q104_6)	❍	❍	❍	❍
How often has someone threatened to harm you physically because of your race/ethnicity? (Q104_7)	❍	❍	❍	❍
How often have you had a teacher be surprised that you did something really well? (Q104_8)	❍	❍	❍	❍
How often have other kids treated you badly because of your race/ethnicity? (Q104_9)	❍	❍	❍	❍
How often have you had a teacher who didn't expect you to do well because of your race/ethnicity? (Q104_10)	❍	❍	❍	❍
How often have you been treated differently in the court system because of your race/ethnicity? (Q104_11)	❍	❍	❍	❍
How often do you feel school staff members (e.g. secretaries, teachers' aides) treat you different from non-Native (non-Indian) kids? (Q104_12)	❍	❍	❍	❍