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AGE OF ALCOHOL USE INITIATION AND LIFETIME ALCOHOL AND ILLICIT DRUG USE AMONG URBAN AMERICAN INDIAN ADOLESCENTS AND THEIR PEERS

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A DISSERTATION APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

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Abstract

From a neocolonial perspective, this study (*N* = 2248) examined the age of alcohol use initiation and alcohol and illicit drug use among urban students (e.g., ages 14-18) in Oklahoma County, focusing on American Indian students. The relationship between the age of alcohol use initiation and lifetime alcohol and illicit drug use was examined through simple linear regressions. Racial/ethnic differences in the age of alcohol use initiation and lifetime alcohol and illicit drug use were examined using two-way ANOVAs. For secondary analyses, gender differences in the age of alcohol use initiation and lifetime alcohol and illicit drug use were examined among American Indians using independent samples t-tests. Results indicated that while a significant relationship between the age of alcohol use initiation and lifetime alcohol and illicit drug use was found, the age of alcohol use initiation is only one of several factors that contribute to lifetime alcohol and illicit drug use. American Indian students did not significantly differ from their peers in the age of alcohol use initiation and lifetime alcohol and illicit drug use. Across racial/ethnic groups, the highest lifetime alcohol and total illicit drug use was reported when alcohol use was initiated in childhood (e.g., age 11 or younger). Results from this study showed that the age of alcohol use initiation for American Indian males was significantly earlier than American Indian females and no significant differences in lifetime alcohol use and illicit drug use were found. The findings of the current research suggest that prevention programs for very young children are needed.

CHAPTER I: Introduction

While being known for the richness of their cultural and spiritual ways and traditions (Limb & Hodge, 2008; Portman & Garrett, 2006), American Indians are also known to face a number of health disparities (Agency for Healthcare Research and Quality, 2004; Kunitz, 2008; Roberts & Jones, 2004) in urban (Forquera, 2001; Urban Indian Health Institute [UIHI], 2009), rural, and reservation settings. According to the Indian Health Service (2006):

> "The American Indian and Alaska Native people have long experienced lower health status when compared with other Americans. Lower life expectancy and the disproportionate disease burden exist perhaps because of inadequate education, disproportionate poverty, discrimination in the delivery of health services, and cultural differences. These are broad quality of life issues rooted in economic adversity and poor social conditions." (p. 1)

American Indian children and adolescents hold a greater burden of health disparities, being at higher risk for substance abuse, mental health problems, suicide, homicide, delinquency, poverty, and dropping out of school compared to the U.S. general population and other ethnic minority groups (Harris, Gorden-Larsen, Chantala, & Udry, 2006; Rhoades, Carey, Jacobs, & Brenneman, 2008; U.S. Department of Health and Human Services, 2001). In the National Longitudinal Study of Adolescent Health study, it was found that American Indian youth were at highest risk of adverse health outcomes for substance use, binge drinking, tobacco use, mental health, diet, inactivity, obesity, violence, sexually transmitted diseases, and health care access, while Caucasian and Asian youth were at lowest risk (Harris, Gorden-Larsen, Chantala, & Udry, 2006). In addition, American Indian youth have high rates of

co-occurring substance use and other psychiatric disorders (Beals et al., 1997; Costello, Farmer, Angold, Burns & Erkanli, 1997; Federman, Costello, Angold, Farmer, & Erkanli, 1997), with considerable rates of substance use disorders, affective disorders, and disruptive behavior disorders (Abbott, 2006).

While there are national (American Psychological Association Office of Ethnic Minority Affairs [OEMA], 2009; National Institute of Health [NIH], 2006; New Freedom Commission on Mental Health, 2003; U.S. Department of Health and Human Services, 2003) and state efforts (Oklahoma Taskforce to Eliminate Health Disparities, 2006) to address health disparities among racial/ethnic minorities in Oklahoma, American Indian children and adolescents face numerous health disparities. In Oklahoma, about 39.6 percent (39,733) of Hispanic children, 37.4 percent (29,850) of Black children, 29.4 percent (21,458) of American Indian children, 18 percent (106,785) of Caucasian children, and 9.1 percent (1,155) of Asian and Pacific Islander children live in poverty (Children's Defense Fund, 2007). Given that approximately 30 percent of American Indian children live in poverty, this puts about one in three to one in four American Indian children at risk for a number of poor health, including negative mental health outcomes (Swinnerton, 2006). Although American Indian children make up 11.9 percent of Oklahoma's child population, they make up 16.8 percent of Oklahoma's dropouts (Oklahoma Institute for Child Advocacy, 2008) and 16.4 percent of the child abuse and neglect confirmations in FY2009 (Oklahoma Department of Human Services, 2009). Given the mental health disparities among American Indian young people in Oklahoma,

ongoing efforts aimed to understand the nature of these health disparities is warranted.

Nationally, American Indian adults and adolescents have greater rates of alcohol and drug use disorders compared to other racial/ethnic groups. In a nationally representative sample using the 2001 to 2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) data, Huang et al. (2006) found that American Indian adults had significantly greater rates of drug use disorders (12.1 percent) than Whites (8.9 percent), Hispanics (7.9 percent), Blacks (6.9 percent), and Asians (4.5 percent). Also, the prevalence of alcohol use disorders among American Indians (4.9 percent) significantly exceeded the rates among Blacks (2.4 percent), and Hispanics (1.7 percent) and Asians (1.7 percent), but not Whites (1.9 percent). Similarly, in a nationally representative sample of persons age 12 and over, the combined 2002, 2003, 2004, and 2005 National Survey on Drug Use and Health (NSDUH) data indicated that American Indians were more likely than members of other racial/ethnic groups to have a past year alcohol use disorder (10.7 vs. 7.6 percent) and a past year illicit drug use disorder (5.0 vs. 2.9 percent) (Substance Abuse and Mental Health Services Administration [SAMHSA], 2007).

American Indian adolescents have greater rates of alcohol and drug use disorders and the need for treatment, compared to their peers. According to the NSDUH, among adolescents ages 12 to 17 in 2003-2004, the alcohol treatment need for American Indian adolescents was 14.1 percent, followed by Whites (6.9 percent), Hispanics (6.1 percent), Native Hawaiian/Pacific Islanders (5.4

percent), Asians (2.9 percent), and Blacks (2.8 percent) (SAMHSA, 2006). The treatment need for illicit drug use among American Indian adolescents was 11.8 percent, followed by Whites and Hispanics (both 5.8 percent), Blacks (3.8 percent), and Asians (2.3 percent) (e.g., treatment need data for Native Hawaiian/Pacific Islanders suppressed due to small sample size) (SAMHSA, 2006).

The use of alcohol and illicit drugs is one of the most stigmatizing (Coyhis & Simonelli, 2008; Coyhis & White, 2006), complex, and difficult problems facing American Indians across the United States (Mail, 2002), with various explanations offered to explain the high rates of alcohol and illicit drug misuse among American Indian people (see Beals et al., 2009; Spillane & Smith, 2007 for reviews). From the 1490's to the 1890's, "Europeans and white Americans engaged in an unbroken string of genocide campaigns against the Native people of the Americas" (Stannard, 1992) (p. 147), which disrupted and displaced many Native communities and families (BigFoot, 2000; BigFoot & Braden, 2007; Cole, 2006; Evans-Campbell, 2008; Weaver, 1998). As a result, many American Indians experienced social disintegration (Jones-Saumty, Thomas, Phillips, Tivis, & Nixon, 2003), intergenerational posttraumatic stress disorder (Duran & Duran, 1995), and historical trauma (Braveheart, 2004; Brave Heart & DeBruyn, 1998; Cole, 2006; Evans-Campbell, 2008; Walters, Simoni, & Evans-Campbell, 2002; Whitbeck, Adams, Hoyt, & Chen, 2004), which have been reported to have numerous consequences at the individual-level, family-level, and community-level (Evans-Campbell, 2008), such as high rates of

current trauma (Willmon-Haque and BigFoot, 2008) and alcohol and illicit drug misuse.

It has been related that among tribes that had alcohol prior to European contact, some had cultural controls or protective factors to minimize problems with alcohol (Coyhis & White, 2006). One of those strategies included reducing the exposure of children to alcohol (Waddell & Everett, 1979). Although this was the case, colonist ideas, such as "firewater myths" portraying American Indians as "drunks" and as genetically inferior (inherently vulnerable to alcoholism), "provided ideological support for the decimation and colonization of Native tribes and continue to serve that function today" (Coyhis & White, 2006, p. 9). Brayboy (2005) presented a theoretical framework, the Tribal Critical Race Theory, for understanding American Indian issues, such as alcohol and illicit drug use, while emphasizing the covert racism facing American Indians. Brayboy stated:

> "The colonization has been so complete that many American Indians fail to recognize that we are taking up colonist ideas when we fail to express ourselves in ways that may challenge dominant society's ideas about who and what we are supposed to be, how we are supposed to behave, and what we are supposed to be within the larger population…TribalCrit builds on the notion that colonization is endemic in society and explicitly recognizes that the policies of the United States toward American Indians are rooted in imperialism, White Supremacy, and a desire for material gain." (p. 431)

Brayboy indicated that "racism has become so deeply ingrained in society's and schooling's consciousness that it is often invisible" (p. 428).

While the statistics reflect that the misuse of alcohol and illicit drugs is a significant problem among American Indians, Coyhis and White (2006) advised

their readers to consider the variability in substance use among American Indians and to situate substance use in a socio-historical context:

> "To portray alcoholism as the most significant problem facing Native communities, ignores the enormous variability of alcohol problems across and within Native tribes and diverts attention from the political, economic and cultural conditions within which Native alcohol problems first arose and have been sustained (Westermeyer, 1974). To speak of Native alcohol problems without speaking of successful Native prevention and recovery movements constitutes a harmful misrepresentation that has endured for more than two centuries (Trimble, 1988)." (p. 7)

Similarly, Mertens (2005) urged researchers to consider the broader cultural context within which people live:

> "If the researcher starts from a deficit view of the minority population, the interpretation of the data will focus on the dysfunctions found within that community. If the researcher starts with a transformative perspective, the researcher will attempt to identify the broader cultural context within which the population functions." (p. 413)

This researcher asks the reader to consider the socio-historical context (Brayboy, 2005; Coyhis & White, 2006; Duran & Duran, 1995; Mertens, 2005) when conceptualizing the use of alcohol and illicit drugs among American Indian people.

While historical trauma has been proposed influence substance use among American Indian adults (Braveheart, 2004; Brave Heart & DeBruyn, 1998; Cole, 2006; Duran & Duran, 1995; Evans-Campbell, 2008; Walters, Simoni, & Evans-Campbell, 2002; Whitbeck, Adams, Hoyt, & Chen, 2004) and numerous individual and contextual risk and protective factors have been linked to alcohol and illicit drug use among children and adolescents in general (Catalano, Hawkins, Berglund, Pollard, & Arthur, 2002; Hawkins, Catalano, &

Miller, 1992), this researcher is particularly interested in the risk factor, *age of alcohol use initiation* (e.g., also described as early alcohol use, age at first drink or onset of alcohol use).

Early alcohol and illicit drug use negatively impacts short-term and long-term development, such as causing alterations in brain development and increasing the potential for addiction (Czechowicz, 1988; National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2006; NIAAA, 2004-2005). Also, adolescent alcohol and illicit drug use is associated with a multitude of life-changing and/or life-threatening problems including: academic problems and delinquency; unwanted, unintended, and unprotected sexual activity; physical and sexual assault; increased risk for suicide and homicide; alcohol and drug-related car accidents; other unintentional injuries such as burns falls, and drowning; and alcohol poisoning and drug overdose (Czechowicz, 1988; Komro, Tobler, Maldonado-Molino, & Perry, 2010; NIAAA, 2004-2005).

While experimenting with alcohol is viewed as normative and seemingly without much consequence, for others, early alcohol use initiation may be associated with later alcohol and illicit drug use and misuse (Hingston, Heeren, & Winter, 2006; McGue, Iacono, Legrand, Malone, & Elkins, 2001; SAMHSA, 2004), delinquency and violence (Hingson, Heeren, & Zakocs, 2001; SAMHSA, 2004), suicidal risk (Swahn & Bossarte, 2007; Swahn, Bossarte, & Sullivent, 2008), and other high-risk behaviors (DuRant, Smith, Kreiter, & Krowchuk, 1999; Hingson, Heeren, Winter, & Wechsler, 2003). In addition, early alcohol use initiation may play a role in three of the five leading causes of injury among

youth ages 10-19 years, that is, suicide, homicide and unintentional injury (Centers for Disease Prevention and Control [CDC], 2001). Therefore, understanding the influence of the age of alcohol use initiation has on lifetime alcohol and illicit drug use among adolescents is an important area of research.

CHAPTER II: Literature Review

The literature related to the age of alcohol use initiation and alcohol and illicit drug use among adolescents is presented along with racial/ethnic and gender differences in these areas.

Early Initiation of Alcohol Use

Early initiation of alcohol use in the United States. In the U.S., many adolescents report initiating alcohol by age 13 and most adults report initiating alcohol use by the age of 21. In their sample, Johnston, O'Malley, and Bachman (2003) reported that more than 50 percent of the 8th graders (e.g., typical age of 14 years) have already used alcohol. The CDC (2007) reported that about a quarter, or 23.8 percent of students had drunk alcohol (more than a few sips) for the first time before the age of 13. In 2003, according to the NSDUH, almost 74 percent of adults aged 21 or older reported that they had started using alcohol before the age of 21 (SAMHSA, 2004). Of this group of adults aged 21 or older, 4 percent first used alcohol before the age of 12, 14 percent first used alcohol between the ages of 12 and 14, 33 percent of persons first used alcohol between the ages of 15 and 17, and 22 percent of persons first used alcohol between the ages of 18 and 20 (SAMHSA, 2004).

In examining racial/ethnic differences, the prevalence of initiating alcohol use before age 13 years was higher among Hispanic (29.0 percent) and Black (26.7 percent) than White (21.5 percent) students (e.g., American Indian data was not reported) (CDC, 2007). Among adults aged 21 or older, Asians were less likely to report having initiated alcohol use before the age of 21 (46

percent) and were less likely to have used alcohol before age 15 (6 percent) than Whites, Blacks, or Hispanics (SAMHSA, 2004). Of these four racial/ethnic groups, Whites had the highest rate of initiating alcohol use before age 15 (20 percent) as well before age 21 (79 percent) (SAMHSA, 2004). Others have found that some Black adolescents are using alcohol at levels that seem comparable over time with Caucasian youth (Flory, Brown, Lynam, Miller, Leukefeld, & Clayton, 2006).

In examining gender differences, male adolescents have typically reported higher rates of alcohol and illicit drug use than females (Bachman, Wallace, O'Malley, Johnson, Kruth, & Neighbors, 1991), although recent research suggests that the gender gap is closing (National Center on Addiction and Substance Abuse at Columbia University, 2003; Wallace, Bachman, O'Malley, Schulenberg, Cooper, & Johnston, 2003). The CDC (2007) reported that the prevalence of initiating alcohol use before age 13 was higher among male (27.4 percent) than female (20.0 percent) students. More specifically, the prevalence of initiating alcohol use before age 13 years was higher among Hispanic male (33.6 percent) and Black male (30.7 percent) than White male (25.0 percent) students. In comparison, the prevalence of having drunk alcohol before age 13 was higher among Hispanic female (24.2 percent) and Black female (22.7 percent) than White female (17.8 percent) students. In addition, the NSDUH, reported that males (83 percent) were more likely than females (65 percent) to report having their first drink before age 21 and to report having initiated alcohol use before age 15 (24 vs. 13 percent) (SAMHSA, 2004).

For alcohol dependence and abuse, among adults aged 21 or older who ever used alcohol, rates of past year alcohol dependence or abuse were lowest among persons who first used alcohol at an older age and highest among persons who initiated alcohol use at a younger age, according to the NSDUH (SAMHSA, 2004). As indicated by the NSDUH, only 3 percent of persons who first used alcohol at age 21 or older were classified as having past year alcohol dependence or abuse. Similar to other researchers (Grant & Dawson, 1997), the NSDUH reported that persons reporting first use of alcohol before age 15 were more than 5 times as likely to have past year alcohol dependence or abuse compared with persons who first used alcohol at age 21 or older (16 vs. 3 percent).

Early initiation of alcohol use in Oklahoma. There is limited information about the early age of initiation of alcohol use in Oklahoma among children and adolescents. According to the available data, it has been reported that Oklahoma youth tend to initiate alcohol at a young age. The Oklahoma State Epidemiological Outcomes Workgroup (2009) reported on the 2008 Oklahoma Prevention Needs Assessment (OPNA) data and indicated that 48 percent of students in grades 6, 8, 10 and 12 had taken more than a sip of alcohol before the age of 13. In comparison, nationally, about 23 percent of students in grades 9-12 had their first drink of alcohol, other than a few sips, before age 13 nationally (CDC, 2007).

Early initiation of alcohol use and gender. Gender differences have been found in the age of alcohol use initiation among youth, with males typically

initiating alcohol and illicit drug use younger than females. According to the U.S. Department of Health and Human Services (2007), the average age when youth first try alcohol is 11 years for boys and 13 years for girls. The National Center on Addiction and Substance Abuse at Columbia University (2003) found that 34.5 percent of ninth grade girls and 17.5 percent of twelfth grade girls having tried alcohol before age 13.

Early initiation of alcohol use and gender in Oklahoma. In terms of gender differences, overall, boys in Oklahoma reported a greater tendency to try alcohol at an earlier age than girls (54 percent of boys reported their first use before age 13 compared to 43 percent of girls) (ODMHSAS, 2008a).

Early initiation of alcohol use among non-American Indian youth.

Few studies have examined the early age of initiation of alcohol use among racially/ethnically diverse children and adolescents. In examining differences in the age of alcohol use among Black and White adolescents, Black adolescents have been found to initiate alcohol use at a later age and increase their use more slowly throughout adolescence (Cooper et al., 2008). Using logistic regression analysis to examine the age of alcohol use initiation and substance use in mid-adolescence among a sample (*N* = 1,213) of mostly urban Black and Hispanic adolescents, Boohar (2004) found that the timing of alcohol use initiation was a significant risk predictor of using marijuana and cocaine and getting drunk or high. She indicated that youth who started drinking by the seventh grade were more likely than those who started drinking later to engage in risky alcohol and illicit drug use outcomes (e.g., using

marijuana or cocaine; getting drunk or high). Chi square analyses revealed different patterns of substance use for boys and girls and Blacks and Hispanics. In particular, from early to middle adolescence, she found that boys and girls showed similar patterns of alcohol use initiation and comparable amounts of alcohol and drug use at a similar frequency. From early to middle adolescence, she found that Hispanic adolescents were more likely than Blacks to have tried alcohol while Hispanic and Black adolescents were equally as likely to have tried marijuana or cocaine.

Early initiation of alcohol use among American Indian youth.

American Indians have been found to initiate alcohol use at a very young age. In a cross-sectional study of sixth and eighth grade Caucasian (n = 2,226; 2,203) and American Indian (n = 105; 98) students in the Northern U.S., Roski, Perry, McGovern, Veblen-Mortenson, and Farbakhsh (1997) found that alcohol use may begin at an especially young age among American Indian adolescents. Roski et al. reported that among sixth graders, past-year alcohol use was reported by 29 percent of American Indian and 18 percent of Caucasian youth.

In small sample of American Indian adolescents, Willmon-Haque (2008) found a negative correlation between age at first substance use (e.g., alcohol and/or drug) and substance abuse (r = .49, n = 6, p < .164) indicating a moderately strong tendency for adolescents who use substances at an early age to endorse higher scores on the substance abuse scale. A linear regression analysis revealed that age at first substance use scores accounted for 23.7 percent of the variance in substance abuse scores. Finally, in their

study of 341 6th-12th grade students residing on a reservation, Rodgers and Fleming (2003) found that the early initiation of alcohol use was related to the use of alcohol but not related to excessive alcohol use.

Age of Alcohol Use Initiation and Alcohol Use

Age of alcohol use initiation and alcohol use among non-American Indian youth. The age of alcohol use initiation has been found to be associated with later alcohol misuse, although the research in this area is mixed. For example, in cross-sectional studies (Grant & Dawson, 1997; Hingson, Heeren, & Winter, 2006; McGue, Iacono, Legrand, Malone, & Elkins, 2001) and longitudinal studies (Buchmann et al., 2009; DeWit, Adlaf, Offord, & Ogborne, 2000; Grant, Stinson, & Harford, 2001a; Grant, Stinson, & Harford, 2001b; Hawkins, Graham, Maguin, Abbott, Hill, & Catalano, 1997; Pitkanen, Kokko, Lyyra, & Pulkkinen, 2008; Prescott & Kendler, 1999; Warner, White, & Johnson, 2007) early alcohol use initiation has been found to increase the risk of alcohol use disorders in adulthood among Caucasians primarily, although some studies have included Blacks and Hispanics.

Grant and Dawson (1997) examined the relationship between age of alcohol use initiation and the prevalence of alcohol abuse and dependence in later adolescence and adulthood using 1992 National Longitudinal Alcohol Epidemiologic Survey data (*N* = 27,616). Comparing Blacks and non-Blacks, the prevalence of lifetime alcohol abuse and dependence was estimated for each year of age at onset of alcohol use from ages 12 to 25 years for the overall sample and separately by gender and race. Linear regression analyses

were used to assess the relationship between age at onset of alcohol use and the odds of alcohol abuse or dependence in late adolescence and adulthood, controlling for the effects of gender, race, age, duration of drinking, family history of alcoholism and current drinking status (drank in the past year) versus former drinker (e.g., drank in the past, but not in the past year).

Grant and Dawson (1997) reported that individuals who retrospectively reported that they had first tried alcohol before age 15 were four times more likely to have a lifetime diagnosis of alcohol dependence than individuals who first used alcohol after age 20. They found that the rates of lifetime dependence declined from more than 40 percent among individuals who started drinking at ages 14 or younger to roughly 10 percent among those who started drinking at ages 20 and older. In terms of alcohol use, Grant and Dawson found that the rates of lifetime abuse declined from about 11 percent among those who initiated use of alcohol at ages 16 or younger to approximately 4 percent among those whose onset of use was at ages 20 or older. After using multivariate logistic regression models to adjust for potential confounders, the odds of alcohol dependence decreased by 14 percent with each increasing year of age at onset of use, and the odds of alcohol abuse decreased by 8 percent (Grant & Dawson, 1997).

In another study, DeWit, Adlaf, Offord, and Ogborne (2000) investigated the influence of early alcohol use initiation as a risk factor for progression to the development of alcohol disorders, controlling for confounding influences. Their data was obtained from a primarily Caucasian (e.g., British/German/Dutch,

French, Southern European, Canadian, or other) community sample (*N* = 5,856) of lifetime drinkers participating in the 1990-1991 Mental Health Supplement of the Ontario Health Survey. Residents of First Nations Peoples' reserves were excluded from the study. Using survival analyses, they found that first use of alcohol at ages 11-14 greatly heightens the risk of progression to the development of alcohol disorders.

DeWit, Adlaf, Offord, and Orgborne (2000) found that those at highest risk of developing alcohol abuse or dependence within ten years of alcohol use initiation began drinking at age 11 or 12 (16 times the risk of those starting after age 19). The next highest group were those who began drinking before age 11 (10 times the risk of those starting after age 19), followed by those age 13 to 14 (9 times the risk of those starting after the age 19) (DeWit, Adlaf, Offord, & Orgborne, 2000). They found that after 10 years, 13.5 percent of persons who began to drink at ages 11 and 12 met the criteria for a diagnosis of alcohol abuse and 15.9 percent had a diagnosis of alcohol dependence. Again, after 10 years, they found that 13.7 percent of persons who began to drink at ages 13 and 14 met criteria for a diagnosis of alcohol abuse and 9.0 percent had a diagnosis of alcohol dependence. In contrast, rates for those who started drinking at ages 19 and older were 2.0 percent and 1.0 percent, respectively (DeWit, Adlaf, Offord, & Orgborne, 2000). Interestingly, they found an unexpected non-linear relationship (e.g., each unit change in age of initiation of alcohol use does not always bring about the same change in later alcohol disorders) between age of first alcohol use and later alcohol disorders with a

delay in progression to harm was observed for the youngest drinkers (ages 10 and under). Finally, hazard regression analyses revealed a nonlinear effect of age at first alcohol use, marked by an elevated risk of developing disorders among subjects first using alcohol at ages 11-14 (DeWit, Adlaf, Offord, & Orgborne, 2000).

Prescott and Kendler (1999) sought to replicate the finding by Dewit, Adlaf, Offord, and Orgborne (2000), that the risk for alcoholism is increased among individuals who begin to drink at an early age and extend the research by addressing causal and non-causal explanations for this association. Structured psychiatric interviews, including assessment of lifetime DSM-IV alcohol abuse and alcohol dependence, were conducted with 8,746 adult Caucasian twins ascertained through a population-based twin registry (Prescott & Kendler, 1999). They reported analyses of individual-level data to study the association between drinking onset and risk for alcohol abuse and alcohol dependence. They used logistic regression to predict probability of diagnostic classification from onset and analyzed pair-level data to investigate the etiology of drinking onset and its association with diagnosis and used bivariate structural twin models to obtain estimates of genetic and environmental proportions of variance and covariance (Prescott & Kendler, 1999).

Interestingly, Prescott and Kendler (1999) found strong evidence for an association between early drinking onset and risk for alcohol dependence, but less evidence for an association with alcohol abuse. They indicated that all of the association between early drinking and later alcohol dependence is due to

familial sources, which probably reflect both shared environmental and genetic factors. They suggested the association between drinking onset and diagnosis is noncausal, and attempts to prevent the development of alcohol dependence by delaying drinking onset are unlikely to be successful.

Likewise, other studies have reported that age at first drink is not specifically associated with alcohol use disorders but rather is instead correlated with a broad range of indicators of disinhibited behavior and psychopathology (McGue, Iacano, Legrant, Malone, & Elkins, 2001). McGue et al. investigated whether the association of age at first drink with alcoholism was more consistent with the hypothesis that the early initiation of alcohol use causes alcohol dependence or the hypothesis that both are manifestations of some common vulnerability. They looked to see whether substance use and mental health disorders, education, IQ, and personality were associated with age at first drink in a sample of 2,670 adults. They also looked at whether P3 amplitude, a psychophysiological marker of alcoholism risk, was associated with age at first drink in a sample of 1,127 17 year-olds. Further, they looked at whether indicators of disinhibitory psychopathology assessed at age 11 predicted age first drink by age 14 in a sample of 1,343 adolescents.

In the 11-year-old twin sample, the effect of being an early drinker (e.g., age 14 years or younger) was investigated by McGue, Iacano, Legrant, Malone, and Elkins (2001) using a logit analysis for diagnostic outcomes and analysis of variance (ANOVA) for quantitative outcomes. In both cases, effects were investigated in a model that included sex and early drinking main effects as well

as a Sex x Early-Drinking interaction. Strength of effect was assessed by using odd ratios (ORs) for diagnostic outcomes and standardized effect sizes (i.e., mean differences in SD units) for quantitative outcomes. The significance level was set at 0.01(two-tailed) in the analysis of the 11-year-old outcome data. The analysis of the event-related potential (ERP) data in the 17-year-old cohort consisted of a two-way ANOVA with age at first drink and sex as independent variables and P3 amplitude as the dependent variable.

McGue, Iacano, Legrant, Malone, and Elkins (2001) found that among adults, age at first drink was associated not only with alcohol dependence, but also with a broad array of indicators of disinhibitory behavior and psychopathology including nicotine dependence, illicit drug abuse and dependence, conduct disorder, antisocial personality disorder, underachievement in school, and the personality trait of constraint. In 17 year-olds, age first drink was also associated with reduced P3 amplitude (McGue, Iacano, Legrant, Malone, & Elkins, 2001). In the early adolescence sample, they found that measures of behavioral disinhibition, including oppositionality, hyperactivity/impulsivity, and inattentiveness assessed at age 11 predicted drinking onset by age 14. They concluded that these findings indicate that age of first drink is not specifically associated with alcoholism but rather is correlated with a broad range of indicators of disinhibited behavior and psychopathology. In addition, individuals who first drink at a relatively early age manifest elevated rates of disinhibitory behavior and psychopathology before they first try alcohol (McGue, Iacano, Legrant, Malone, & Elkins, 2001).

While fewer studies in this area have been conducted with adolescents, in a largely Hispanic and African American sample (*N* = 1,034), Stueve and O'Donnell (2005) examined the relationship between early alcohol use initiation and subsequent alcohol and sexual risk behaviors among urban adolescents at seventh and 10th grade. After controlling for early sexual initiation, they examined relations between early drinking and subsequent alcohol and sexual behaviors. They found that early drinking was associated with alcohol and sexual risks through mid-adolescence. Further, early drinkers were more likely to report subsequent alcohol problems, unprotected sexual intercourse, multiple partners, being drunk or high during sexual intercourse, and pregnancy. In particular, among females, early alcohol use initiation was found to be associated with subsequent alcohol use and misuse at mid-adolescence. These findings indicate the complex nature of the research around the early initiation of alcohol use and the need for further research.

Age of alcohol use initiation and alcohol use among American Indian youth. Few studies have examined the age of alcohol use initiation and subsequent alcohol use among American Indian adolescents. Instead, most of the studies have examined early alcohol initiation or intoxification and subsequent alcohol dependence in adulthood. Along the lines of the McGue, Iacano, Legrant, Malone, and Elkins (2001) study, in a sample of 525 Southwest California (SWC) adult Indians residing on reservations, Ehlers, Slutske, Gilder, Lau, and Wilhelmsen (2006) used survival analyses and Cox and logistic regression to investigate the relationship between age of onset of

first intoxification and the development of alcohol dependence. They found that the early onset of intoxication was found to be significantly associated with both a shorter time to onset of alcohol dependence and increased prevalence in this population, even on taking into account several other risk factors including externalizing diagnoses. Ehlers et al. suggested that their findings are consistent with the hypothesis that early age of onset of use and alcohol dependence both arise from a common familial vulnerability to problem alcohol use which may be partially explained by undefined environmental variables that may uniquely affect drinking in SWC Indians (e.g., access to alcohol and no tribal sanctions against drinking).

Age of Alcohol Use Initiation and Illicit Drug Use

Age of alcohol use initiation and illicit drug use among non-American Indian youth. Studies have found that the early use of alcohol, such as in preadolescence, is related to increased illicit drug use in adolescence. Kosterman, Hawkins, Guo, Catalano, and Abbott (2000) sought to examine the patterns and predictors of alcohol initiation among a sample of 808 ethnically diverse youth. In their longitudinal study, they used survival analyses and complementary log-log regression to model hazard rates and etiology of initiation with time-varying covariates. They reported that at the age of 10.5, 25 percent of the youth reported that they had tried alcohol. They found that alcohol initiation rose steeply up to the age of 13 years and then increased more gradually with most youth having initiated by 13 years old (Kosterman, Hawkins, Guo, Catalano, & Abbott, 2000).

In a descriptive study examining substance use initiation in preadolescence for high risk Black and White adolescents who were incarcerated for juvenile offenses (93 males and 96 females), Prinz and Kerns (2003) found that the age of alcohol use initiation reportedly occurred by age 10 for 17 percent of the juveniles. By age 10, they found that alcohol use was reported by more females (18 percent) than males (15 percent). While males showed substantial rates of early substance initiation, taking into account types of substances and association with lifetime frequency, they concluded that females with early substance initiation demonstrated more problematic substance use patterns. Moreover, chi-square analyses were conducted to determine whether early use of alcohol, was associated with any lifetime use of inhalants, hallucinogens or crack/cocaine (Prinz & Kerns, 2003). They found that juveniles who initiated alcohol use very (e.g., before age 10) had greater hallucinogen and crack/cocaine use. On the other hand, they found that the early initiation of alcohol use (e.g., before age 12) was not associated with use of inhalants, hallucinogens or crack/cocaine.

Age of alcohol use initiation and illicit drug use among American Indian youth. Few if any studies have examined the age of alcohol use initiation and illicit drug use among American Indian adolescents. Again, most of the studies in this area have examined early alcohol initiation and subsequent illicit drug use in adulthood. Among a sample of American Indian adults in the Southwestern part of the U.S. (*N*= 1,086), Kunitz (2008) used bivariate and multivariate analyses and found that age of alcohol use initiation is

a significant risk factor for both alcohol dependence and polysubstance use. In particular, they reported that the younger the age at first drink predicted a greater number of substances used and there was an increased likelihood of use of each class of substances.

In another study, Barnes, Welte, and Hoffman (2002), in a large representative sample of New York State 7-12 grade students (*N* = 19,321) surveyed in 1994, examined the variations in the relationship between alcohol use to other substance use and delinquency in subsamples of gender, age and racial/ethnic groups. They indicated that the sample was just about evenly divided by gender (49 percent girls) and age (range 12 to 18, mean age 15.1), and the race/ethnicity distribution was diverse (56 percent White, 13 percent Hispanic, 11 percent Black, 7 percent West Indian, 6 percent American Indian, and 5 percent Asian).

After controlling for significant sociodemographic factors in a regression analysis, Barnes, Welte, and Hoffman (2002) found that all of the alcohol measures remained strong predictors of both illicit drug use and delinquency. Significant interactions between alcohol measures and gender, age and racial/ethnic groups were also found (Barnes, Welte, & Hoffman, 2002). For example, they found that the relationship between binge drinking and delinquency was stronger for males than females. In addition, they indicated that the relationships between alcohol measures and both illicit drug use and delinquency were stronger for younger adolescents than older adolescents. Notably, if they began drinking at an early age, American Indians had an added

risk over other groups of using illicit drugs and being delinquent (Barnes, Welte, & Hoffman, 2002).

Finally, it is clear from the literature review that the age of alcohol use initiation is related to subsequent alcohol and illicit drug use in adulthood. This is less clear among adolescents, particularly, American Indian adolescents. This present study will build on the previous literature on the age of alcohol initiation and later alcohol and illicit drug use by examining this association as well as differences by race/ethnicity and gender among a sample of ethnically diverse students in an urban area.

Theory

This study is informed by three major theories—neocolonial theory, risk and protective factors theory, and gateway theory. Neocolonial theory or neocolonialism (Rieger, 2004a; Rieger, 2004b) places American Indian alcohol and illicit drug problems within a larger socio-historical context. Rieger (2004a) speaks of neocolonialism in this way:

> "But while colonialism in its political manifestations of direct government over a particular area is indeed over, many of the colonial structures persist. Even though direct patronizing structures at the political level have been discontinued with the end of colonialism, patronizing structures continue at other levels, including the economic and intellectual…talk about neocolonialism serves as a reminder that, even in a postcolonial age, colonial mentalities have not disappeared; many have simply been pushed underground and have adapted in other ways, frequently taking more vicious shapes than ever before." (p. 207)

While postcolonial perspectives (Brayboy, 2005; Coyhis & White, 2006; Duran & Duran, 1995) inform this dissertation, the writer of this paper chooses to use the prefix *neo* rather than *post* because post suggests aftermath. The author of

this dissertation believes that colonization has altered into new forms (see Duran, Firehammer, & Gonzalez, 2008; Sue et al., 2007). Certainly, dealing with voyages of expansion is very real but so are the newly emerging forms of colonialism. Morgan (1983) offers an interesting discussion of the principles underlying the role of alcohol in the colonization of American Indians. She argues that domination of American Indians are maintained through: (1) the shaping of public perceptions about the effects of alcohol on American Indians, (2) promoting drugs and alcohol intoxification to dissipate political protest and (3) controlling the supply of drugs and alcohol as a means of manipulation to anesthetize the misery of American Indians and foster an escapist attitude. Further, "By portraying alcohol or other drugs as a function of racial inferiority, by portraying alcoholism as the primary source of crime, violence, insanity, disease, and social disorder, the colonizer escapes culpability for the processes of colonization from which these very problems flow" (p. 210) (Coyhis & White, 2006).

Neocolonial theory also explores internal mechanisms that are operative in maintaining the problems of alcohol and drug misuse among American Indians. As Freire (1970) wrote "For cultural invasions to succeed, it is essential that those invaded become convinced of their intrinsic inferiority" (p. 151). Internalized oppression manifests itself in several ways in American Indians. Lurie (1974) explored how drinking replaces real protest against an unjust society. Some American Indians, consciously or unconsciously, resist conventional Euro-American roles and the means and models of the market

economy through acts of personal disorganization. Dempsey (2002) describes the process of how American Indians internalize hatred toward themselves and other American Indians, which results in suicide and the murder (e.g., lateral violence) of other American Indians. Coyhis and White (2006) argue that American Indians inculcate feelings that they cannot be in leadership positions nor solve problems in their own communities but need others to assume those positions to direct them. Finally, neocolonial theory teaches that American Indians are not lazy, incompetent, or drunks but they are oppressed and capable of resistance and revitalization.

In addition to neocolonial theory, two other theories were used to explain the etiology of alcohol and drug use. The study builds upon the risk and protective factor theory, a prevention theory, which focuses on explaining the etiology or risk factors associated with alcohol and illicit drug use among adolescents (Catalano, Hawkins, Berglund, Pollard, & Arthur, 2002; Hawkins, Catalano, & Miller, 1992). As early as 1990, Moncher, Holden, and Trimble (1990) reported on the utility of the risk factor approach in identifying youth at high risk for substance use or abuse among American Indian adolescents. It is expected that this study, looking at the risk factor, *age of alcohol use initiation*, will add content to the risk and protective factor literature. Another theory that has been widely accepted has focused on understanding the nature of early alcohol use initiation and later illicit drug use, the gateway theory (e.g., otherwise known as stage or progression theory) (Kandall, Kessler, & Margulies, 1978). This theory explains the escalation of substance use from

licit substances (e.g., tobacco or alcohol) to illicit drugs such as marijuana then to other illicit drugs such as crack/cocaine and methamphetamines (Kandall, Kessler, & Margulies, 1978); however it has been in question particularly among ethnic minority populations. Ginzler, Domenech-Rodriguez, Cauce, and Whitbeck (2003) stated:

> "A recent study of American Indian youths (Novins et al., 1998) has also substantiated the growing concern for early use of inhalants among this population. The gateway theory was developed to explain behaviors in broad, normative populations. These studies focusing on higher risk groups suggest that gateway theory is not as good a fit for explaining substance-use behaviors of special/clinical populations or across diverse ethnic groups. This is possibly due to the fact that these people were socialized in an environment of high substance-use, and entry into that subculture was not a slow progression, but rather a rapid initiation to a wide array of substances." (p. 727)

While this study is not specifically interested in showing the sequence of progression from early alcohol use to later illicit drug use, this study is interested in extending the early alcohol use initiation literature by examining if American Indian adolescents who begin drinking at a young age are more at risk of higher lifetime alcohol and illicit drug use than those who start drinking later. As stated by Cummings, Davies, and Campbell (2000):

> "The assumption underlying targeted prevention and early intervention programs is that because an array of risk factors in the child and/or the environment, children at risk are more likely than children without such risk factors to develop cognitive, social, emotional, and/or behavioral problems that may become stable or even worsen with development. It is also assumed that the earlier a child can be deflected from a maladaptive pathway to a more adaptive one, the greater the likelihood of a good outcome and the lower the overall risk for impaired functioning, problematic adjustment, or a full-blown disorder. This perspective is rooted in the view that early experience sets the stage for later functioning (Hebb, 1949; Hunt, 1961), although it is recognized that later experiences play an important role as well." (p. 380)

This researcher is also interested in racial/ethnic and gender differences. While examining the gateway theory and the etiology of substance use are areas for further research among American Indian adolescents, this study will focus on gaps in the literature related to the age of initiation of alcohol use among American Indian adolescents, suggesting that initiating alcohol use at a young age places American Indian youth at risk for diverting to a pathway in life that is problematic (e.g., later alcohol and drug misuse and dependence etc.).

Gaps in the Literature

There are number of gaps in the literature related to the age of alcohol use initiation and alcohol and illicit drug use. First, while a large body of research has connected early alcohol use to subsequent alcohol use later in life (DeWit, Adlaf, Offord, & Ogborne, 2000; Grant & Dawson, 1997; Prescott & Kendler, 1999), fewer studies have investigated the association between early alcohol use and subsequent illicit drug use (Sintov, Kendler, Walsh, Patterson, & Prescott, 2009). Second, studies typically have not included a wide-range of drugs in examining lifetime illicit drug use, such as prescription drugs, non-prescription cough or cold medicine, and methamphetamines. The use of methamphetamines among American Indians is worrisome, with American Indians having the highest use of methamphetamines in the U.S. (National Congress of American Indians, 2006).

Third, most of the studies related to early drinking focus on drinking in adolescence, with few studies examining the onset of underage drinking in childhood or preadolescence (Donovan, 2007). While the age of what is

considered “early” initiation of alcohol use varies across studies, most studies have largely examined the early use of alcohol in early adolescence (e.g., before age 15) and later alcohol abuse or dependence in adulthood. In a recent review of the adolescent alcohol initiation literature, Donovan (2004) indicated that most of what is known about alcohol initiation among adolescents describes the “normative onset,” that is the ages when most adolescents start to drink. In 2007, the *Surgeon General’s Call to Action to Prevent and Reduce Underage Drinking* indicated that gaps remain in our knowledge of preadolescent alcohol use and that this makes it difficult to effectively address very early underage drinking (U.S. Department of Health and Human Services, 2007).

Fourth, while the rates of age of initiation of alcohol use among American Indian adolescents have been compared to non-American Indian youth, typically, statistical tests have not been used to determine if differences in the age of alcohol use initiation among American Indians and non-American Indians is statistically significant. Several studies have, however, examined the prevalence of substance use among American Indian adolescents in comparison with their peers. While national surveys examine racial/ethnic differences in alcohol and illicit drug use, American Indians are not included in some national surveys such as the MFT study. Data sets available in the MFT public archive include only the racial groups Black, White, and Other in order to reduce the risk that this information could reveal an respondent’s identity and small sample sizes among some ethnic groups can yield estimates that may be

unreliable (P. Meyer, personal communication, October 21, 2009). Looking at racial/ethnic differences is important because recent research suggests that risk factors for alcohol use in adolescents and young adults vary according to ethnic group and deserve further investigation (Chartier, Hesselbrock, & Hesselbrock, 2009; Griffin, Scheier, Botvin, & Diaz, 2000).

Fifth, few if any studies have examined the early initiation of alcohol use among multiracial American Indian adolescents. In general, there is a dearth of studies on multiracial adolescents (Choi, Harachi, Gillmore, & Catalano, 2006; Cooney & Radina, 2000). Multiracial adolescents may face unique challenges in managing two or more different racial identities (e.g., peer acceptance) (Cheng & Lee, 2009; Shih & Sanchez, 2005) which may make them at risk for substance use (Jackson & LeCroy, 2009). Past studies have not provided the opportunity to report membership in more than one racial/ethnic group (offering only a forced single option) and have not had large enough samples of multiracial individuals for statistically meaningful subgroup analyses (Spencer, Icard, Harachi, Catalano, & Oxford 2000). Related to this issue, a recent report by the *Subcommittee on Standardized Collection of Race/Ethnicity Data for Healthcare Quality Improvement* (Institute of Medicine [IOM], 2009) recommended that "The recording of specific multiracial combinations (e.g., American Indian or Alaska Native *and* Black) is preferred by the subcommittee over assigning a single 'multiracial' category to all persons of mixed race" (p. 85).

Examining racial/ethnic differences may be helpful because recent research suggests that risk factors for alcohol use in adolescents and young adults vary according to ethnic group (Chartier, Hesselbrock, & Hesselbrock, 2009; Griffin, Scheier, Botvin, & Diaz, 2000). In terms of risk and protective factors for alcohol and illicit drug use, including the early initiation of alcohol use, the Oklahoma Department of Mental Health and Substance Abuse Services recently published a report focusing on risk and protective factors for substance use among American Indian adolescents in the state of Oklahoma public school system, providing more data about American Indian students than previously available (ODMHSAS, 2008b). However, this report primarily publishes percentages in terms of risk and protection and is limited in the statistical analyses.

Sixth, the age of alcohol use initiation and lifetime alcohol and drug use among *urban* American Indian adolescents has not been investigated. While many American Indians live on reservations and in rural areas, nearly seven out of 10 American Indians live in cities or suburbs (Urban Indian Health Commission [UIHC], 2007). Urban American Indians are a diverse population who tend to be dispersed throughout the metropolitan area which may result in a less of a sense of community than those living on reservations (Forquera, 2001). While some urban American Indians have maintained close ties with their culture and traditions, many youth living in urban areas have not been able to do so. For example, many girls and boys are not able to be involved in

traditions/rituals that connect them with their culture and to develop a sense of pride in their ancestry and identity as an American Indian (Clark & Witko, 2006).

Many studies related to alcohol and illicit drug use has been conducted on reservations or rural areas (Beauvais, Jumper-Thurman, Helm, Plested, & Burnside, 2004). In the state of Oklahoma, 7.9 percent (*n* = 273,230) of the population identify themselves as only American Indian, and 11.4 percent (*n* = 391,949) report being American Indian in combination with one or more other races (e.g., bi/multiracial) (U.S. Census Bureau, 2000). Recent reports indicate that American Indians make up a significant number, nearly 20 percent, of the number of students enrolled in the state of Oklahoma public school system (Oklahoma State Department of Education, 2008). More specifically, in 2007, the makeup of children and adolescents enrolled in the Oklahoma public school system was 58.1 percent Caucasian (372,638), 19.2 percent American Indian (123,051), 10.8 African American (69,383), 10 percent Hispanic (64,191), and 1.9 percent Asian or Pacific Islander (12,458) (Oklahoma State Department of Education, 2008). In the Oklahoma City public school district in 2008-2009, which includes Oklahoma County, the racial/ethnic composition is different with 40.2 percent Hispanic, 30.2 percent Black, 21.8 percent White, 5.3 percent American Indian, and 2.5 percent Asian or Pacific Islander (Oklahoma State Department of Education, 2009). The Native American Student Services at the Oklahoma City Public Schools reported having 1,949 American Indian students enrolled in their program this year (e.g., 2010), (S. Bradford, personal communication, March 29, 2010). As indicated by prominent researchers in the

American Indian substance abuse field, Oetting and Beauvais (1990) indicated that “local surveys provided an impetus for action in individual schools and communities and can serve as one basis for long-term evaluation of local prevention programs” (p. 392). Further, the desire for more local data, such as county data, in investigating health disparities has been called for in Oklahoma (Oklahoma Taskforce to Eliminate Health Disparities, 2006).

Finally, recent data suggests that there has been an increase in alcohol and illicit drug use among girls over the past few decades and that more girls, ages 12-17, are initiating alcohol use than boys (Office of National Drug Control Policy, 2006; Puzzanchera, 2009). In particular, among American Indian girls, in a recent sample of White and American Indian adolescents ages 12 and 13 (e.g., seventh graders) in a Northern Plains state, American Indian girls exceeded American Indian boys as well as White girls and White boys on lifetime use of alcohol, marijuana, and inhalants (Spear, Longshore, McCaffrey & Ellickson, 2005). In a nationally representative sample of ethnically diverse eighth, 10th, and 12th grade girls (e.g., from 1996-2000 MTF data), alcohol and marijuana use was highest among American Indian girls across all three grades (Wallace, Bachman, O'Malley, Schulenberg, Cooper, & Johnston, 2003). Given this, some researchers have suggested that early alcohol and illicit drug use among females is an area that deserves considerably more research (Prinz & Kerns, 2003). For example, in order to examine and highlight gender differences in the early initiation of substance use, Kumpfer, Smith, and Summerhays (2008) encouraged researchers to conduct separate gender

analyses to enhance the current understanding of the precursors to substance use among girls. Further, according to Amaro, Blake, Schwartz, and Flinchbaugh (2001):

> "There is a serious paucity of relevant studies, including the national surveys that report data simultaneously by gender, race/ethnicity, and age. Most studies have focused predominantly on comparing incidence and prevalence of substance use overall or by age (often combining youth with adults), and they have handled gender and ethnicity separately. However, when such data are examined by gender for specific age groups or contexts, important patterns emerge (i.e., few if any gender differences exist on many measures of substance use among younger cohorts). Moreover, studies also have shown a change in the pattern of drug use, particularly among younger adolescent girls, with an increasing gender convergence in rates of adolescent substance use over the past 10 years in all ethnic and racial groups." (p. 260)

Not only do we have limited knowledge about the age of alcohol initiation use among girls in general, we have even less knowledge about this subject for American Indian girls.

Research Questions

In a sample of urban American Indian students and their peers (e.g., ages 14-18) in Oklahoma County (e.g., a predominately urban area encompassing Oklahoma City and 20 smaller cities located in central Oklahoma), the purpose of this study is to address the following six research questions:

RQ1: Is the age of alcohol use initiation associated with higher (1) lifetime alcohol and (2) lifetime illicit drug use?

RQ2: How do the age of alcohol use initiation in childhood (e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14-16) groups differ on their

lifetime alcohol use? Do racial/ethnic groups differ on their lifetime alcohol use? Is there an interaction, or does the effect of age of alcohol use initiation on lifetime alcohol use differ by race/ethnicity?

RQ3: How do the age of alcohol use initiation in childhood (e.g., age 11or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14-16) groups differ on their *total* lifetime illicit drug use (e.g., marijuana, inhalants, hallucinogens, cocaine, methamphetamines, other stimulants, sedatives, heroin, ecstasy, prescription drugs, and non-prescription cough medicine)? Do racial/ethnic groups differ on their *total* lifetime illicit drug use? Is there an interaction, or does the effect of age of alcohol use initiation on *total* lifetime illicit drug use differ by race/ethnicity?

RQ4: How do the age of alcohol use initiation in childhood (e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14-16) groups differ on their lifetime use of various illicit drugs (e.g., marijuana, inhalants, hallucinogens, cocaine, methamphetamines, other stimulants, sedatives, heroin, ecstasy, prescription drugs, and non-prescription cough medicine)? Do racial/ethnic groups differ on their lifetime illicit drug use? Is there an interaction, or does the

effect of age of alcohol use initiation on the lifetime use of various illicit drugs differ by race/ethnicity?

RQ5: Are American Indian males more likely than females to have initiated alcohol and illicit drug use at a younger age?

RQ6: Are American Indian males more likely than females to report higher lifetime alcohol and illicit drug use?

Hypotheses

This study tested the following six hypotheses:

H1: It is expected that the earlier age of alcohol use initiation will be associated with higher lifetime alcohol and illicit drug use.

H2: It is expected that the age of alcohol use initiation in childhood (e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14-16) groups will differ on their lifetime alcohol use. It is expected that racial/ethnic groups will differ on their lifetime alcohol use. Further, it is anticipated an interaction, or the effect of age of alcohol use initiation on lifetime alcohol use will differ by race/ethnicity given the socio-historical context and current health disparities faced by American Indians, in particular. Data suggests that American Indian youth are at increased risk for earlier initiation of alcohol use and higher lifetime alcohol use, followed by Whites, Hispanics, and African Americans (Cooper et al., 2008; National Institute of Drug Abuse [NIDA], 2003), thus it is expected that in examining group

differences, this study will have similar findings. Previous research has suggested that multiracial adolescents may face unique challenges in managing two or more different racial identities (Cheng & Lee, 2009; Shih & Sanchez, 2005) which may make them at risk for substance use (Jackson & LeCroy, 2009), thus it is anticipated that in examining group differences, this study will have similar findings.

H3: It is expected that the age of alcohol use initiation in childhood (e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14 - 16) groups will differ on their *total* lifetime illicit drug use (e.g., marijuana, inhalants, hallucinogens, cocaine, methamphetamines, other stimulants, sedatives, heroin, ecstasy, prescription drugs, and non-prescription cough medicine). It is expected that racial/ethnic groups will differ on their *total* lifetime illicit drug use. Further, it is anticipated an interaction, or the effect of age of alcohol use initiation on *total* lifetime illicit drug use will differ by race/ethnicity given the socio-historical context and current health disparities faced by American Indians, in particular. Data suggests that American Indian youth are at increased risk for earlier initiation of alcohol use and higher lifetime illicit drug use, followed by Whites, Hispanics, and African Americans (Cooper et al., 2008; NIDA, 2003), thus it is expected that in examining group differences, this

study will have similar findings. Previous research has suggested that multiracial adolescents may face unique challenges in managing two or more different racial identities (Cheng & Lee, 2009; Shih & Sanchez, 2005) which may make them at risk for substance use (Jackson & LeCroy, 2009), thus it is anticipated that in examining group differences, this study will have similar findings.

H4: It is expected that the age of alcohol use initiation in childhood (e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14 -16) groups will differ on their lifetime use of various illicit drugs (e.g., marijuana, inhalants, hallucinogens, cocaine, methamphetamines, other stimulants, sedatives, heroin, ecstasy, prescription drugs, and non-prescription cough medicine). It is expected that racial/ethnic groups will differ on their lifetime use of various illicit drugs. Further, it is anticipated an interaction, or the effect of age of alcohol use initiation on the lifetime use of various illicit drugs use will differ by race/ethnicity given the socio-historical context and current health disparities faced by American Indians, in particular. Data suggests that American Indian youth are at increased risk for earlier initiation of alcohol use and higher lifetime alcohol use, followed by Whites, Hispanics, and African Americans (Cooper et al., 2008; NIDA, 2003), thus it is expected that in examining group

differences, this study will have similar findings. Previous research has suggested that multiracial adolescents may face unique challenges in managing two or more different racial identities (Cheng & Lee, 2009; Shih & Sanchez, 2005) which may make them at risk for substance use (Jackson & LeCroy, 2009), thus it is anticipated that in examining group differences, this study will have similar findings.

H5: It is expected that American Indian males will be more likely than females to have initiated alcohol use at a younger age.

H6: It is expected that American Indian males will be more likely than American Indian females to report higher lifetime alcohol and illicit drug use. Data suggests that although the gap between male and female alcohol use is closing, that male students continue to be more at risk for alcohol and illicit drug use in general (NIDA, 2003), thus it is expected that this study will have similar findings.

CHAPTER III: Method

Participants

The archival data used for this study was obtained from participants of the 2008 ODMHSAS Oklahoma Prevention Needs Assessment, a survey of sixth, eighth, 10th, and 12th grade students in public, private, and charter schools in the state of Oklahoma. The OPNA survey was designed to assess students' involvement in problem behaviors, as well as their exposure to risk and protective factors shown to influence the likelihood of alcohol and illicit drug use, academic success, school dropout, violence, and delinquency among students in the state of Oklahoma (ODMHSAS, 2008a). A total of 66,951 students in Oklahoma completed the 2008 OPNA survey. Participants eligible to be included in this study were OPNA participants attending a school in Oklahoma County (*n* = 8,376), who were 14-18 years old. Due to missing data, however, 2,248 students were included in the final sample

Measures

The OPNA survey was initially developed collaboratively through the combined efforts of six states and the Social Development Research Group at the University of Washington (e.g., for a description of refinements made to survey since its initial development, see ODMHSAS, 2008a). According to the ODMHSAS, the scales of the survey were originally developed between 1994 and 1997 through testing with over 100,000 students. The 2008 OPNA survey included 17 risk factor and12 protective factor scales (e.g., 139 questions with

296 items). Most of the questions related to alcohol and illicit drug use are similar to those used in the national Monitoring the Future study.

The demographic information utilized in this study included grade, gender, race, and ethnicity. For race, participants were asked, "What is your race," with the answer choices being Asian, Hawaiian or other Pacific Islander, American Indian, Alaskan Native, Black or African American, and White. For ethnicity, students were asked, "Are you Hispanic or Latino," with the answer choices being "yes" or "no." Initially, the researcher created a race/ethnicity category including the possible race/ethnicity group combinations. To make the dataset more manageable by reducing the number of racial/ethnic groups in this study, the researcher deleted Asians, Pacific Islanders, and Alaska Native participants, leaving 15 racial/ethnic groups. To further reduce racial/ethnic groups, the researcher created the American Indian bi/multiracial (e.g., American Indian and any combination of Hispanic, Black, or White) and non-American Indian bi/multiracial (e.g., any combination of Hispanic, Black, or White, but not American Indian) groups. The six racial/ethnic groups used in this study were: (1) Hispanic only (2) American Indian non-Hispanic, (3) Black non-Hispanic (4) White non-Hispanic, (5) American Indian bi/multiracial, and (6) non-American Indian bi/multiracial.

The description and scoring of the measures used in this study are presented below.

Age of alcohol use initiation. Age of alcohol use initiation was measured by the question, "How old were you when you first had more than a

sip or two of beer, wine, or hard liquor (for example, vodka, whiskey, or gin)," with the answer choices being 10 or younger, 11, 12, 13, 14, 15, 16, 17 or older, and Never. For this study, the students who reported "Never" initiating alcohol use were excluded from this study. In addition, those who reported initiating alcohol use at age 17 or older were deleted because of the focus being on the age of alcohol use initiation in childhood, early adolescence, and middle adolescence.

Age of alcohol use initiation categories. From the question above, this researcher created three ages of alcohol use initiation categories: (1) childhood (e.g., age 11 or younger), early adolescence (e.g., ages 12 and 13), and middle adolescence (e.g., ages 14-16).

Lifetime alcohol use. The variable, lifetime alcohol use measured the frequency of alcohol use over the lifetime. Lifetime alcohol use was be used as a continuous variable and was measured by the question, "On how many occasions (if any) have you had alcoholic beverages (beer, wine or hard liquor) to drink in your lifetime—more than just a few sips," with the answer choices being "40 or more" (score of 7), "20-39" (score of 6), "10-19" (score of 5), "6-9" (score of 4), "3-5" (score of 3), "1-2" (score of 2), and "0 occasions" (score of 1).

Lifetime illicit drug use. The variable, lifetime illicit drug use measured the frequency of illicit drug use over the lifetime and their lifetime use of a number of different illicit drugs. *Total* lifetime illicit drug use was used as a continuous variable and was measured by the question, "On how many occasions (if any) have you used marijuana, inhalants, hallucinogens, cocaine,

methamphetamines, other stimulants, sedatives, heroin, ecstasy, prescription drugs, and non-prescription cough medicine in your lifetime," with the answer choices being "40 or more" (score of 7), "20-39" (score of 6), "10-19" (score of 5), "6-9" (score of 4), "3-5" (score of 3), "1-2" (score of 2), and "0 occasions" (score of 1). *Total* lifetime illicit drug use was used as a total score by adding up scores for each type of illicit drug (e.g., marijuana, inhalants, hallucinogens, cocaine, methamphetamines, other stimulants, sedatives, heroin, ecstasy, prescription drugs, and non-prescription cough medicine). In examining the lifetime use of each illicit drug, the score for each illicit drug was used (e.g., for example, for marijuana, using 1-2 times in one's lifetime would be a score of 1).

Below is a list of the questions and scoring for each of the illicit drugs used in this study.

Lifetime marijuana use. To assess lifetime marijuana use, students were asked, "On how many occasions (if any) have you used marijuana (grass, pot) or hashish (hash, hash oil) in your lifetime," with the answer choices being "40 or more" (score of 7), "20-39" (score of 6), "10-19" (score of 5), "6-9" (score of 4), "3-5" (score of 3), "1-2" (score of 2), and "0 occasions" (score of 1).

Lifetime hallucinogen use. To measure lifetime hallucinogen use, students were asked, "On how many occasions (if any) have you used LSD or other hallucinogens in your lifetime," with the answer choices being "40 or more" (score of 7), "20-39" (score of 6), "10-19" (score of 5), "6-9" (score of 4), "3-5" (score of 3), "1-2" (score of 2), and "0 occasions" (score of 1).

Lifetime cocaine use. To assess for lifetime crack or cocaine use, students were asked, “On how many occasions (if any) have you used cocaine or crack in your lifetime,” with the answer choices being “40 or more” (score of 7), “20-39” (score of 6), “10-19” (score of 5), “6-9” (score of 4), “3-5” (score of 3), “1-2” (score of 2), and “0 occasions” (score of 1).

Lifetime inhalant use. To measure lifetime inhalant use, students were asked, “On how many occasions (if any) have you sniffed glue, breathed the contents of an aerosol spray can, or inhaled other gases or sprays, in order to get high in your lifetime,” with the answer choices being “40 or more” (score of 7), “20-39” (score of 6), “10-19” (score of 5), “6-9” (score of 4), “3-5” (score of 3), “1-2” (score of 2), and “0 occasions” (score of 1).

Lifetime phenoxydine use. To measure lifetime phenoxydine use, students were asked, “On how many occasions (if any) have you used phenoxydine (pox, px, breeze) in your lifetime,” with the answer choices being “40 or more” (score of 7), “20-39” (score of 6), “10-19” (score of 5), “6-9” (score of 4), “3-5” (score of 3), “1-2” (score of 2), and “0 occasions” (score of 1).

Lifetime methamphetamine use. To assess for lifetime methamphetamine use, students were asked, “On how many occasions (if any) have you used methamphetamines (meth, speed, crank, crystal meth) in your lifetime,” with the answer choices being “40 or more” (score of 7), “20-39” (score of 6), “10-19” (score of 5), “6-9” (score of 4), “3-5” (score of 3), “1-2” (score of 2), and “0 occasions” (score of 1).

Lifetime other stimulant use. To measure lifetime stimulant use, students were asked, “On how many occasions (if any) have you used stimulants other than methamphetamines (such as amphetamines, Ritalin, or Dexedrine) without a doctor telling you to take them in your lifetime,” with the answer choices being “40 or more” (score of 7), “20-39” (score of 6), “10-19” (score of 5), “6-9” (score of 4), “3-5” (score of 3), “1-2” (score of 2), and “0 occasions” (score of 1).

Lifetime sedative use. To measure lifetime sedative use, students were asked, “On how many occasions (if any) have you used sedatives (tranquilizers, such as Valium or Xanax, barbiturates or sleeping pills) without a doctor telling you to take them in your lifetime,” with the answer choices being “40 or more” (score of 7), “20-39” (score of 6), “10-19” (score of 5), “6-9” (score of 4), “3-5” (score of 3), “1-2” (score of 2), and “0 occasions” (score of 1).

Lifetime heroin use. To measure lifetime heroin use, students were asked, “On how many occasions (if any) have you used heroin or other opiates in your lifetime,” with the answer choices being “40 or more” (score of 7), “20-39” (score of 6), “10-19” (score of 5), “6-9” (score of 4), “3-5” (score of 3), “1-2” (score of 2), and “0 occasions” (score of 1).

Lifetime ecstasy use. To measure lifetime ecstasy use, students were asked, “On how many occasions (if any) have you used MDMA (X, E, Ecstasy) in your lifetime,” with the answer choices being “40 or more” (score of 7), “20-39” (score of 6), “10-19” (score of 5), “6-9” (score of 4), “3-5” (score of 3), “1-2” (score of 2), and “0 occasions” (score of 1).

Lifetime prescription drug use. To measure lifetime prescription drug use, students were asked, “On how many occasions (if any) have you used prescription drugs (such as Valium, Xanax, Ritalin, Adderrall, Oxycontin, or sleeping pills) without a doctor telling you to take them in your lifetime,” with the answer choices being “40 or more” (score of 7), “20-39” (score of 6), “10-19” (score of 5), “6-9” (score of 4), “3-5” (score of 3), “1-2” (score of 2), and “0 occasions” (score of 1).

Lifetime non-prescription drug use. To measure lifetime non-prescription drug use, students were asked, “On how many occasions (if any) have you used a non-prescription cough or cold medicine (robos, DMX, etc.) to get high and not for medical reasons in your lifetime,” with the answer choices being “40 or more” (score of 7), “20-39” (score of 6), “10-19” (score of 5), “6-9” (score of 4), “3-5” (score of 3), “1-2” (score of 2), and “0 occasions” (score of 1).

Procedures

In this section, a brief description of the Institutional Review Board (IRB) process for this study as well as the OPNA survey administration process is presented.

Institutional Review Board approval. After receiving IRB approval for this study as non-human subjects research with little risk of re-identification of subjects first from the University of Oklahoma and second, ODMHSAS, this researcher was granted access to the 2008 OPNA data on-line.

OPNA survey administration process. The OPNA survey administration process began in the fall of 2007 and continued through spring

2008 (ODMHSAS, 2008a). According to the ODMHSAS, all school district superintendents in the state of Oklahoma were mailed a letter regarding the 2008 OPNA in September 2007 from the ODMHSAS Commissioner, indicating that the survey would be administered from February 12th through March 27th (e.g., in 2008). The school district superintendents were instructed to return the district participation consent form to confirm participation of their district in the survey. The superintendents were asked to name a person to be the District Coordinator for the survey project.

While not required, superintendents had the option to obtain active parental consent for students to take the survey. Otherwise, participating superintendents were asked to create a way to distribute passive parental consent forms. Parent refusals were tracked and that information was distributed to appropriate teachers before the survey date to ensure that these students would not take the OPNA survey. All parents were provided with a letter that indicated that their child's class would be set to take the survey during one class period in the spring of 2008. The letter indicated that (1) their child's participation is completely voluntary and confidential, (2) if their child does not participate s/he will not be penalized or lose any school benefits to which s/he is otherwise entitled, and (3) their child may discontinue the survey or skip any or all questions on the survey without penalty or loss of any school benefits to which s/he is otherwise entitled.

The OPNA materials were distributed to each school and/or teacher at least three days before the survey data. Each survey required students to fill

out a school district number and a school number provided by the teacher. On the day of the survey, the students were told the survey was anonymous and they were allowed an entire class period to complete the survey. Each student was given a survey booklet that contained the question items and a place for him/her to record responses. The survey booklet did not have the student's name, or any identifying information on it. Before they began, students were reminded they should not write their name or other identifying information on the booklet.

When completing the survey, students were arranged in the classroom so that their responses could not be seen by the teacher administering the survey or by any of the student's peers. At the end of the class period, the survey booklets were immediately gathered and placed in a sealed envelope or box. Contacts at each school picked up the completed surveys and shipped them to the project evaluator using a prepaid FedEX Ground label. When class was over, students were given Teen-line hot-line cards (e.g., crisis/mental health phone number for teenagers) while placing their surveys in the survey envelopes.

Data Analyses

The first research question examined if, for the entire sample, the age of alcohol use initiation is associated with higher lifetime alcohol and drug lifetime use, using a simple linear regression.

The second research question examined group differences between American Indian students and their peers who initiate alcohol use in childhood

(e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14-16) and their lifetime alcohol use using a two-way between groups ANOVA.

The third research question examined group differences between American Indian students and their peers who initiate alcohol use in childhood (e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14-16) and their *total* lifetime illicit drug use (e.g., marijuana, inhalants, hallucinogens, cocaine, methamphetamines, other stimulants, sedatives, heroin, ecstasy, prescription drugs, and non-prescription cough medicine) using a two-way between groups ANOVA.

For the fourth research question, the researcher intended to examine whether American Indian students who initiate alcohol use in childhood (e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14-16) differ from their peers in their lifetime illicit drug use, breaking down illicit drugs into several categories (e.g., marijuana, inhalants, hallucinogens, cocaine, methamphetamines, other stimulants, sedatives, heroin, ecstasy, prescription drugs, and non-prescription cough medicine), using a MANOVA. However, as indicated in the results section, this was not done due to several key assumptions not being met.

Further, for research questions five and six, this study examined gender differences in the age of alcohol use initiation and lifetime alcohol and illicit drug use among American Indian adolescents, the group that is the central focus of this study, using independent samples t-tests.

CHAPTER VI: Results

This chapter presents the dissertation findings for the six hypotheses advanced forth by this researcher. The chapter begins with a description of data management procedures and the handling of missing data. Next, the descriptive statistics are reported to familiarize the reader with the sample characteristics. The results of each hypothesis, including a discussion of the assumptions related to each of the analyses is presented.

Data Management and Missing Data

Counseling psychologist researchers have been urged to report the extent and nature of missing data and the procedures and rationale used to manage missing data (Scholmer, Bauman, & Card, 2010). There are varying recommendations of evaluating when missing data becomes problematic. Scholmer et al. stated:

> "Experts have not reached a consensus regarding the percentage of missing that becomes problematic. Schafter (1999) recommended 5% cutoff. However, Bennett (2001) suggested that when more than 10% of data is missing, statistical analyses are likely to be biased; and others have used 20% (e.g., Peng et al., 2006)." (p. 2)

The missing data in this study ranged from 2.1 to 6.9 percent, with 2.1 percent missing gender (n = 47) and 6.9 percent missing ethnicity (n = 155). Regarding race/ethnicity, the researcher was not comfortable with keeping those cases in which, for example, a person checked "American Indian" for race but did not provide their ethnicity (e.g., Hispanic or non-Hispanic), which was a separate question. Instead, the researcher considered the cases which did not answer both questions regarding race and ethnicity to be missing data.

In considering how to manage missing data, Tabachnick and Fidell (2001) indicated that deletion of cases is a reasonable choice if the missing data pattern appears random and if only a very few cases have missing data, and those cases are missing data on different variables. However, for this study, several cases had missing data on different variables. Scholmer, Bauman, and Card (2010) reported that pairwise deletion is useful when missing values are large and may result in the deletion of a number of cases, such as is the case in listwise deletion. However, pairwise deletion may result in different sample sizes for each correlation (Scholmer et al., 2010). Despite this, the researcher chose this method because a large number of cases would have been deleted using listwise deletion. Thus, the final sample included 2,248 student participants. The method used to obtain the final sample is described below.

Several steps were taken to prepare the data for analysis. The 2008 OPNA database received from the ODMHSAS included 66,951 cases. The researcher created a new database which only included participants in Oklahoma County (n = 8,376). As indicated earlier, Asians, Pacific Islanders, and Alaska Native students were deleted from the sample, leaving 7,743 cases. The researcher created a race/ethnicity variable which included all possible racial/ethnic combinations, leaving the researcher with 24 racial/ethnic groups. One case was deleted because the post hoc analysis would not run because one of the racial/ethnic group combinations had less than two cases (n = 7,742). Since this study was concerned with the age of alcohol use initiation,

those who reported “never” initiating alcohol use were deleted from the database (*n* = 4,319). Cases that had missing data for alcohol use initiation were also deleted (*n* = 4,108). Next the researcher deleted cases that were below age 14 and over age 18 (*n* = 2,832). The researcher chose to delete cases who initiated alcohol use at age 17 and over because focus was not on initiating alcohol use in later adolescence (*n* = 2,714). Cases who that had missing data for both lifetime alcohol and illicit drug use were deleted because this data was need for all of the analyses in this study (*n* = 2,413). Finally, the researcher removed cases who reported “0 occasions” for lifetime alcohol use because there truthfulness was suspect as to be included in the sample thus far, they must have reported an age of alcohol use initiation (*n* = 2,248).

Data Screening

The data was analyzed using PASW Statistics 17 (e.g., formally SPSS 17). Before analysis of the data, the data was screened for outliers and none were found.

Descriptive Statistics

. **Demographics.** Participants ranged in age from 14 to 18 years (*N* = 2,248, *M* = 15.6, *SD* = 1.406) as shown in Table 1. About 31.6 percent (*n* = 711) were age 14, 15.5 percent (*n* = 348) age 15, 27.1 (*n* = 610) age 16, 10.9 percent (*n* = 246) age 17, and 14.8 percent (*n* = 333) age 18. There were more females than males in the sample, with 54.6 percent female (*n* = 1202) and 45.4 percent (*n* = 999) male. Most of the participants were in the eighth (37.9 percent, *n* = 853), 10th (39.3 percent, *n* = 884), and 12th (20.8 percent; *n* = 467)

grades, with much fewer in the sixth, ninth, and 11th grade. About half of the sample was Whites non-Hispanic (52.4 percent, *n* = 1097), followed by Hispanics only (16.5 percent, *n* = 345), Blacks non-Hispanic (13.1 percent, *n* = 275), and American Indians non-Hispanic (4.4 percent, *n* = 92). The bi/multiracial groups were similar with 6.6 percent (*n* = 138) being American Indian bi/multiracial and 7.0 percent (*n* = 146) being non-American Indian bi/multiracial.

Age of alcohol use initiation. The age for students initiating alcohol use ranged from age 10 or younger to 16 (*N*= 2248, *M* = 12.9, *SD* = 1.958), indicating that the *Healthy People 2010* goal to "increase the age and proportion of adolescents who remain alcohol and drug free" from age 13.1 in 1998 to age 16.1 by 2010 (U.S. Department of Health and Human Services, 2002) was not met for this students in this study. More specifically, the largest percentage of students in this sample reported first having had more than a sip or two of beer, wine, or hard liquor (for example, vodka, whiskey, or gin) at age 10 or younger (19.3 percent, *n* = 433), followed by age 13 (18.2 percent, *n* = 409), age 14 (17 percent, *n* = 382), age 15 (14.9 percent, *n* = 335), age 12 (12.4 percent, *n* = 279), age 16 (9.8 percent, *n* = 220), and age 11 (8.5 percent, *n* = 190). For the age of alcohol use initiation categories, 27.7 percent (*n* = 623) initiated alcohol use in childhood (e.g., ages 11 or younger), 30.6 (*n* = 688) in early adolescence (e.g. age 12 and 13) and 41.7 percent (*n* = 937) in middle adolescence (e.g., ages 14-16). Finally, the age of alcohol use initiation categories by race/ethnicity is shown in Table 2.

Hypothesis 1

Before conducting the simple regression analyses, bivariate correlational analyses were used to check for interrelationships between the variables of interest in this study. Pearson product-moment correlations between the variables are displayed in Table 3. Significant relationships emerged between the age of alcohol use initiation and lifetime alcohol use (r = -.132, p = .000) and lifetime illicit drug use (r = -.196, p < .000), but they were not highly related. Interestingly, there was not a significant relationship between lifetime alcohol use and illicit drug use.

For research question one, it was hypothesized that an earlier age of alcohol use initiation would be associated with higher lifetime alcohol and higher *total* lifetime illicit drug use. For the first part of the hypothesis, a simple linear regression was conducted to evaluate the prediction of lifetime alcohol use from the age of alcohol use initiation. Since significance tests are heavily dependent on sample size and with a large enough sample, such as this one, even very small differences among the group means will be declared statistically significant (Stevens, 1999), an alpha = .01 was used for the simple linear regression analyses.

Simple linear regression depends on two major assumptions (Green & Salkind, 2005), of which neither were violated. The first assumption of independence of observations was not violated. The second assumption of normality was not violated since the histograms followed the normal curve and

normality plots followed a reasonability straight line. No skewness and kurtosis are values were greater than +3 or less than -3 (Tabachnick & Fidell, 2001).

An inverse relationship between the age of alcohol use initiation and lifetime alcohol use was found as predicted. Although the age of alcohol use initiation significantly predicted lifetime alcohol use scores, β= -.132 $t(2246) = -6.320$, $p < .000$, the age of alcohol use initiation explained a small proportion of variance in lifetime alcohol use scores, $r^2 = .017$, $F(1, 2246) = 39.941$, $p < .000$, as indicated in Table 4. This means that about 2 percent of the variance of lifetime alcohol use was accounted for by its linear relationship with the age of alcohol use initiation.

For the second part of the hypothesis, a simple linear regression was used to evaluate the prediction of *total* lifetime illicit drug use from the age of alcohol use initiation. The first assumption of independence of observations was not violated. The second assumption of normality, this was to be expected given the nature of illicit drug use among adolescents. For example, it was expected that most of the variables would be positively skewed, that is a large majority of students would report never having used illicit drugs. With reasonably large samples, skewness will not make a substantive difference in the analysis while kurtosis can result in an underestimate of the variance, but this risk is reduced in larger sample sizes (e.g., greater than 200) (Tabachnick & Fidell, 2001).

It was predicted that there would be an inverse relationship between the age of alcohol use initiation and *total* lifetime illicit drug use. Although the age

of alcohol use initiation significantly predicted *total* lifetime illicit drug use scores, β = -.196, $t(2174) = -9.301$, $p < .000$, the age of alcohol use initiation explained a small proportion of variance in *total* lifetime illicit drug use scores, $r^2 = .038$, $F(1, 2174) = 86.507$, $p < .000$, as shown in Table 5. About 4 percent of the variance of lifetime illicit drug use was accounted for by its linear relationship with the age of alcohol use initiation. These findings provide support for the hypothesis that an earlier age of alcohol use initiation is associated with higher lifetime alcohol and *total* lifetime illicit drug use.

Hypothesis 2

For the second and third research questions, two-way between subjects ANOVAs were conducted. The ANOVA is a widely used parametric statistic for examining differences between groups (Cone & Foster, 2005), allowing this researcher to test for main effects, that is if there is a significant effect for each of the independent variables (Mertens, 2005), the age of alcohol use initiation groups and race/ethnicity groups on the criterion variable. In addition, this researcher also tested to see if there were any interaction effects or if any of the independent variables vary systematically with each other (Mertens, 2005). Before conducting the analyses, the researcher examined the students' age to determine if age should be a covariate or control variable in the ANOVA models in this study. Since there were no significant differences with and without the covariate, the researcher chose to continue with the ANOVAs as opposed to the ANCOVA.

For research question two, it was hypothesized that students who initiate alcohol use in childhood (e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14-16) would differ on their lifetime alcohol use and that racial/ethnic groups would differ on their lifetime alcohol use. The researcher also explored whether the age of alcohol use initiation and race/ethnicity would have an interactive influence on lifetime alcohol use or the effect of age of alcohol use initiation on *total* lifetime illicit drug use would differ by race/ethnicity. The two-way ANOVA depends on three major assumptions (Green & Salkind, 2005), of which one was violated for hypothesis two. The first assumption of independence of observations was not violated. For the second assumption of normality, the histograms followed the normal curve and normality plots followed a reasonability straight line. Although alcohol use distributions are usually skewed toward the low end of the scale (Getz & Bray, 2005), this was not the case in this study. No skewness or kurtosis values were in the extreme range.

The Levene's Test of Equality of Error Variances revealed that the third assumption, homogeneity of variance, was not met. Pallant (2005) indicated if the Levene's Test is significant (less than .05), that it is recommended that a more stringent significance level (e.g., .01) be used, which was done in this study. Further, Cone and Foster (2005) indicated that when the statistic becomes more conservative, that it decreases the probability of a Type 1 error, as a way of protecting against the bias introduced by heterogeneity of variances.

Data were analyzed using 3 x 6 [Age of Alcohol Use Initiation (childhood, early adolescence, and middle adolescence) x Race/Ethnicity groups (Hispanics only, American Indians non-Hispanic, Blacks non-Hispanic, Whites non-Hispanic, American Indian bi/multiracial, and non-American Indian bi/multiracial)] ANOVA to evaluate the effects of age of alcohol use initiation and race/ethnicity on lifetime alcohol use. The ANOVA indicated a significant main effect for the age of alcohol initiation, $F(2, 2075) = 17.837$, $p < .000$, $\eta^2 = .02$; however, the effect size was small, as shown in Table 6. The partial-eta-squared and eta squared guidelines are .01 for a small effect size, .06 for a medium effect size, and .14 for a large effect size (Cohen, 1988). There was also a significant main effect for race/ethnicity, $F(5, 2075) = 8.435$, $p < .000$, $\eta^2 = .02$; however, the effect size was also small. There was a significant interaction effect between the age of alcohol use initiation and race/ethnicity, $F(10, 2075) = 1.883$, $p < .04$, $\eta^2 = .01$, on lifetime alcohol use, with a small effect size. In other words, the effect of age of alcohol use initiation on *total* lifetime illicit drug use differed by race/ethnicity

Since there was a significant result for the interaction between the age of alcohol use initiation and race/ethnicity, this researcher examined the profile tests to explore this relationship further. As predicted, all racial/ethnic groups had the highest lifetime alcohol use when alcohol use was initiated in childhood (e.g., age 11 or younger). However, interestingly, lifetime alcohol use was less at each increasing age of alcohol use initiation group for all students except American Indians non-Hispanic and American Indian bi/multiracial students.

American Indians non-Hispanic and American Indian bi/multiracial students who initiated alcohol use in middle adolescence had higher lifetime alcohol use scores than those who initiated alcohol use younger, in early adolescence (e.g., ages 12 and 13). Compared to their peers, the Hispanics only group reported the highest lifetime alcohol use in childhood (e.g., ages 11 or younger), with lifetime alcohol use being less for those initiating alcohol use in early adolescence (e.g., ages 12 and 13), and even being lesser for those who initiated alcohol use in middle adolescence (ages 14-16). Non-American Indian bi/multiracial students had the second highest lifetime alcohol use when initiating alcohol use in childhood, with lifetime alcohol use being similar in those who initiated alcohol use in early adolescence and middle adolescence. White non-Hispanics and Black non-Hispanics had this tendency as well.

Since the homogeneity of variance (e.g., homoscedaticity) assumption was violated, the researcher examined the simple main effects for age of initiation of alcohol use and race/ethnicity separately though one-way between groups ANOVAs (Cone & Foster, 2005) using the Games and Howell post hoc test since it is preferable with unequal *n* designs (e.g., the Games and Howell is not available in the two-way ANOVA analyses) (Cone & Foster, 2005). The first one-way ANOVA was conducted to explore the impact of the age of alcohol use initiation in childhood, early adolescence and middle adolescence on lifetime alcohol use. The Welch's Robust Tests of Equality of Means of the *F* ratio was analyzed (Field, 2008) since the assumption of homogeneity of variance was not met. There was a statistically significant difference at the $p<.01$ level in

lifetime alcohol use among those initiating alcohol use in childhood, middle adolescence, and late adolescence, $F(2, 1378.49) = 18.850$, $p < .000$, as shown in Table 7. Despite reaching statistical significance, the actual difference in mean scores between groups was small (partial eta squared = .02).

Post hoc tests were done to see what mean differences were contributing to any significant effects found (Cone & Foster, 2005). Using the Games Howell test, the researcher found that students initiating alcohol use in childhood (e.g., ages 11 or younger) ($M = 4.75$, $SD = 1.90$) had significantly higher mean lifetime alcohol use than initiating alcohol use in early adolescence (e.g., ages 12 and 13) ($M = 4.24$, $SD = 1.81$) and in middle adolescence (e.g., ages 14-16) ($M = 4.19$, $SD = 1.76$). However, although there was a significant difference between groups, in a practical sense, the mean differences were very small. Those initiating alcohol use in early adolescence (e.g., ages 12 and 13) ($M = 4.24$, $SD = 1.81$) did not differ significantly on lifetime alcohol use from those who initiated alcohol use in middle adolescence (e.g., ages 14-16) ($M = 4.19$, $SD = 1.76$). These post-hoc results supported research hypothesis two in this study.

The second one-way ANOVA was conducted to explore the impact of race/ethnicity on lifetime alcohol use. Again, since the assumption of homogeneity of variance was not met, the Welch's Robust Tests of Equality of Means of the F ratio was analyzed (Field, 2008). There was a statistically significant difference at the $p<.01$ level in lifetime alcohol use for race/ethnicity, $F(5, 428.08) = 9.015$, $p < .000$) as shown in Table 8. Despite reaching

statistical significance, the actual difference in mean scores between groups was small (partial eta squared = .02).

Post hoc comparisons using the Games Howell test indicated that the lifetime alcohol use mean score for American Indians non-Hispanic (*M* = 4.30, SD = 1.1.84) was not significantly different from Hispanics (*M* = 4.42, *SD* = 1.791), Blacks non-Hispanic (*M* = 3.75, *SD* = 1.650), Whites non-Hispanic (*M* = 4.51, *SD* = 1.862), American Indian bi/multiracial students (*M* = 4.34, *SD* = 1.870), and non-American Indian bi/multiracial students (*M* = 4.47, *SD* = 1.774). The mean score for Blacks non-Hispanic was significantly different from Hispanics only (*M* = 4.42, SD = 1.791), Whites non-Hispanic (*M* = 4.51, *SD* = 1.862), and non-American Indian bi/multiracial (*M* = 4.47, *SD* = 1.774) students. These post-hoc results partially supported the research hypothesis, but only for Black non-Hispanic students. It was expected that Blacks non-Hispanic students would report significantly lower lifetime alcohol use.

Hypothesis 3

For research question three, it was hypothesized that the age of alcohol use initiation in childhood (e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14-16) groups would differ on their *total* lifetime illicit drug use (e.g., marijuana, inhalants, hallucinogens, cocaine, methamphetamines, other stimulants, sedatives, heroin, ecstasy, prescription drugs, and non-prescription cough medicine) and there would be differences in *total* lifetime illicit drug use by race/ethnicity. The researcher also explored whether the age of alcohol use initiation and

race/ethnicity would have an interaction influence on *total* lifetime illicit drug use.

The two-way ANOVA depends on three major assumptions (Green & Salkind, 2005), of which two were violated for hypotheses three. The first assumption of independence of observations was not violated. The second assumption of normality was violated as revealed by the histograms and normality plots. Further, several skewness and kurtosis values were in the extreme range. While the normality assumption was not met, this was to be expected given the nature of illicit drug use among adolescents. For example, it was expected that most of the variables would be positively skewed, that is a large majority of students would report never having used illicit drugs. Moreover, regarding the assumption of normality, Green and Salkind (2005) indicated that in applications with a larger sample size, a two-way ANOVA may yield reasonably accurate *p* values even when the normality assumption is violated, which is the case in this study. Tabachnick and Fidell (2001) indicated that the univariate *F* is robust to modest assumptions of normality as long as the violations are not due to outliers. The Levene's Test of Equality of Error Variances revealed that the third assumption, homogeneity of variance assumption, was not met. As with the previous hypothesis, since Levene's Test was significant, a more stringent significance level (e.g., .01) for evaluating the results was used (Pallant, 2005; Tabachnick & Fidell, 2001).

Data were analyzed using 3 x 6 [Age of Alcohol Use Initiation (childhood, early adolescence, and middle adolescence) x Race/Ethnicity groups (Hispanic

only, American Indians non-Hispanic, Blacks non-Hispanic, Whites non-Hispanic, American Indian bi/multiracial, and non-American Indian bi/multiracial)] ANOVA to evaluate the effects of age of alcohol use initiation and race/ethnicity on *total* lifetime illicit drug use. The ANOVA indicated no significant interaction between the age of alcohol use initiation categories and race/ethnicity, $F(10, 2009) = 1.452$, $p < .152$, $\eta^2 = .01$, on *total* lifetime illicit drug use, but significant main effects for the age of alcohol use initiation, $F(2,2009) = 18.914$, $p < .000$, $\eta^2 = .02$ and race/ethnicity, $F(5, 2009) = 4.706$, $p < .000$, $\eta^2 = .01$ as shown in Table 9. The partial eta squared was small for these main effects. Since the homogeneity of variance assumption was violated, the researcher examined the simple main effects for age of initiation of alcohol use and race/ethnicity separately though one-way between groups ANOVAs (Cone & Foster, 2005). As done for the pervious hypothesis, the researcher used the Games and Howell post hoc test since it preferable with unequal *n* designs (Cone & Foster, 2005).

The first one-way ANOVA was conducted to explore the impact of the age of alcohol use initiation in childhood, early adolescence, and middle adolescence on *total* lifetime illicit drug use. The Welch's Robust Tests of Equality of Means *F* ratio was analyzed (Field, 2008) since the homogeneity of variance assumption was not met. There was a statistically significant difference at the $p<.01$ level in *total* lifetime illicit drug use among those initiating alcohol use in childhood, early adolescence, and middle adolescence, $F(2, 1214.168) = 27.327$, $p < .000$, as shown in Table 10. Despite reaching

statistical significance, the actual difference in mean scores between groups was small (partial eta squared = .03). Using the Games Howell test, the researcher found that the mean score for *total* lifetime illicit drug use among those initiating alcohol use in childhood (e.g., ages 11 or younger) (M = 22.74, SD = 17.32) was significantly greater than those initiating alcohol use in early adolescence (e.g., ages 12 and 13) (M = 18.50, SD = 11.21) and middle adolescence (e.g., ages 14-16) (M = 17.03, SD = 9.62). These post-hoc results supported research hypothesis three in this study.

A second one-way ANOVA was conducted to explore the impact of race/ethnicity on *total* lifetime illicit drug use. Again, since the assumption of homogeneity of variance was not met, the Welch's Robust Tests of Equality of Means of the F ratio was analyzed (Field, 2008). There was a statistically significant difference at the p<.01 level in *total* lifetime illicit drug use for race/ethnicity, $F(5, 421.239) = 3.629$, $p < .003$, as shown in Table 11. Despite reaching statistical significance, the actual difference in mean scores between groups was very small (partial eta squared = .01).

There were few significant differences to report in *total* lifetime illicit drug use by race/ethnicity. The post hoc comparisons using the Games Howell test indicated that the mean *total* lifetime illicit drug use score for Hispanics only (M = 17.24, SD = 10.646) was significantly lower than White non-Hispanics (M = 19.53, SD = 13.268) and non-American Indian bi/multiracial students (M = 21.55, SD = 15.631). The mean *total* lifetime illicit drug use score for American Indians non-Hispanic (M = 20.54, SD = 13.331) was not significantly different,

although it was higher than Whites non-Hispanic (*M* = 19.53, *SD* = 13.268), Blacks non-Hispanic (*M* = 18.21, *SD* = 13.783), American Indian bi/multiracial (*M* = 17.84, *SD* = 9.201), and Hispanics only (*M* = 17.24, *SD* = 10.646), but not higher than non-American Indian bi/multiracial (*M* = 21.55, *SD* = 15.631) students.

Hypothesis 4

Intending on using a multivariate analysis of variance (MANOVA) for research question four, it was hypothesized that students who initiated alcohol use in childhood (e.g., age 11 or younger), in early adolescence (e.g., ages 12 and 13), and in middle adolescence (e.g., ages 14-16) would differ on their lifetime use of each of the 12 various illicit drugs (e.g., marijuana, inhalants, hallucinogens, cocaine, methamphetamines, other stimulants, sedatives, heroin, ecstasy, prescription drugs, and non-prescription cough medicine). Further, it was anticipated that an interaction, or that the effect of age of alcohol use initiation on the lifetime use of various illicit drugs would differ by race/ethnicity.

The MANOVA has four major assumptions, including normality, linearity, homogeneity of variance/co-variance matrices, and multicollinearity (Pallant, 2005; Tabachnick & Fidell, 2001), which all four were violated. According to Pallant, the MANOVA is generally robust to non-normality. The assumption of linearity was not met as there was not a straight-line relationship between each pair of dependent variables as recommended by Pallant. The homogeneity of variance-covariance matrices was also violated given the Box's M significance

value was larger than .001. According to Weinfurt (1995), this violation is serious because the MANOVA demands that the covariance for all unique pairs of the dependent measures be equal for all groups.

To assess for multicollinearity among the dependent variables, bivariate correlations were performed. Pallant indicated that correlations around .8 to .9 are concerning, which occurred between several of the illicit drugs. When this occurs, removing the strongly correlated pairs of dependent variables or alternatively combining them to form a single measure is recommended for use in an ANOVA (Pallant, 2005; Tabachnick & Fidell, 2001). Hypothesis three in this study did just this---used a single measure of *total* lifetime illicit drug use; therefore, conducting the MANOVA was not necessary.

Hypothesis 5

For research question five, it was hypothesized that there would be significant differences between American Indian males and females, with American Indian males having initiated alcohol use at a younger age than American Indian females. The researcher combined the American Indians non-Hispanic and American Indian bi/multiracial students for this analysis. Since comparing only two groups, a t-test was the most suitable and because different subjects are in the two groups, a *t*-test for independent samples was most appropriate (Cone & Foster, 2005) for this analysis. The independent-samples t-test depends on three major assumptions (Pallant, 2005), of which none were violated. The first assumption of independence of observations was not violated. For the second assumption of normality, the histograms followed the

normal curve and normality plots followed a reasonability straight line. No skewness and kurtosis values were in the extreme range. The Levene's Test of Equality of Error Variances revealed that the third assumption, homogeneity of variance, was met. There were significant differences in the age of alcohol use initiation for American Indian males (M = 12.18, SD = 1.899) and American Indian females, M = 12.82, SD = 1.911; $t(221) = -2.474$ $p < .01$, indicating that hypothesis five was supported. The age of alcohol use initiation for males was significantly earlier than females. Despite reaching statistical significance, the actual difference in mean scores between groups between small and moderate (partial eta squared = .03).

Hypothesis 6

For the sixth research question, it was hypothesized that American Indian males would be more likely than American Indian females to report higher lifetime alcohol and illicit drug use. In order to address this hypothesis, two independent-samples t-tests were conducted, the first with lifetime alcohol use and the second, with lifetime illicit drug use. For the first part of hypothesis six, none of the assumptions were violated. The first assumption of independence of observations was met. For the second assumption of normality, the histograms followed the normal curve and normality plots followed a reasonability straight line. No skewness and kurtosis values in the extreme range. For the third assumption, the Levene's Test of Equality of Error Variances revealed that the homogeneity of variance assumption was met. There were no significant differences in scores for American Indian males (M =

4.45, *SD* = 1.914) and American Indian females, *M* = 4.27, *SD* = 1.838; *t*(221) = -718, *p* < .24, on lifetime alcohol use, indicating this part of the hypothesis was not supported.

For the second part of hypothesis six, one of the assumptions was violated. The independence of observations assumption and homogeneity of variance assumptions were met. For the assumption of normality, the histograms did not follow the normal curve and normality plots did not follow a reasonability straight line. Skewness and kurtosis values were also in the extreme range. As in previous analyses, this non-normality is expected given that a large majority of students would report never have used illicit drugs. For the third assumption, the Levene's Test of Equality of Error Variances revealed that the homogeneity of variance assumption was met. There were no significant differences in scores for American Indian males (*M* = 18.88, *SD* = 11.557) and American Indian females, *M* = 19.22, *SD* = 10.970; *t*(217) = -.221, *p* < .41, on lifetime illicit drug use, indicating this part of the hypothesis was not supported.

CHAPTER V: Discussion

In this study, adolescents in Oklahoma County initiated alcohol use at a younger age than their peers nationally and the state of Oklahoma. Nationwide, approximately 10 percent of 9 to 10 year olds have starting drinking (Donovan et al., 2004) and approximately 27.8 percent of youth began drinking before age 13 in 2003 (Grunbaum et al., 2004) and 25.6 percent in 2005 (Eaton et al., 2006). Similarly, nationally, about 23 percent of students in grades 9-12 had their first drink of alcohol, other than a few sips, before age 13 in 2007 (CDC, 2007). As indicated in the literature review, the Oklahoma State Epidemiological Outcomes Workgroup (2009) reporting on the 2008 OPNA data, indicated that 48 percent of students in the state of Oklahoma (e.g., grades 6, 8, 10 and 12) had taken more than a sip of alcohol before age 13.

In this study, about one third (27.7 percent) of students reported first having had more than a sip or two of beer, wine, or hard liquor in childhood (age 11 or younger), and 58.3 percent of students began drinking at age 13 and under. In 2006, the Oklahoma Governor's Task Force on Prevention of Underage Drinking (2006) reported that underage drinking was increasing in Oklahoma. These findings reflect this and it appears that the initiation of alcohol use in childhood (e.g., age 11 and younger) and early adolescence (e.g., ages 12 and 13) is quite common among students in Oklahoma.

Hypothesis 1

In this study, this author hypothesized a relationship between the age of alcohol use initiation and lifetime alcohol use, with initiating alcohol use at a

younger age being associated with higher lifetime alcohol use. As predicted, results from the regression analyses revealed a significant inverse relationship between the age of alcohol use initiation and lifetime alcohol use. Though this hypothesis was supported, the minimal effect sizes suggest that the early initiation of alcohol use is only one of several factors that contribute to lifetime alcohol and illicit drug use among adolescents. These include several individual, family, school, and community risk factors for alcohol and illicit drug use identified in the mainstream literature (Bogenschneider, 1996; Hawkins, Catalano, & Miller, 1992; Hogan, Gabrielsen, Luna, & Grothaus, 2003), as well as socio-historical factors in the American Indian specific literature (Braveheart & DeBruyn, 1998; Clark & Witko, 2006; Coyhis & White, 2006; Duran, Firehammer, & Gonzalez, 2008; LaDue, 2008; Walters, Simoni, & Evans-Campbell, 2002; Whitbeck, Adams, Hoyt, & Chen, 2004).

Hypothesis 2 and 3

For research question two and three, it was hypothesized that students who initiate alcohol use in childhood (e.g., age 11 or younger) in early adolescence (e.g., ages 12 and 13) and in middle adolescence (e.g., ages 14-16) would differ on their (1) lifetime alcohol and (2) illicit drug use and that racial/ethnic differences would be found. The researcher also explored whether the age of alcohol use initiation and race/ethnicity would have an interactive influence on lifetime alcohol and illicit drug use. Although the data suggests that American Indian youth are at increased risk for earlier initiation of alcohol use and higher lifetime alcohol and illicit drug use, followed by Whites,

Hispanics, and African Americans (Cooper et al., 2008; NIDA, 2003), this study did not find that American Indians were at the highest risk.

As predicted, across all racial/ethnic groups, the highest lifetime alcohol and illicit drug use was reported when alcohol use was initiated in childhood (e.g., age 11 or younger); however, the actual mean differences were small. For lifetime alcohol use, compared to their peers, Hispanics reported the highest lifetime alcohol use in childhood (e.g., ages 11 or younger), with lifetime alcohol use being less for those initiating alcohol use in early adolescence (e.g., ages 12 and 13), and even less for those initiating alcohol use in middle adolescence (ages 14-16). Non-American Indian bi/multiracial students had the second highest lifetime alcohol use when initiating alcohol use in childhood, with lifetime alcohol use being similar in those who initiated alcohol use in early adolescence and middle adolescence. White non-Hispanic and Black non-Hispanic students had this tendency as well. From these findings, it can be suggested that in general, drinking in childhood, at age 11 or younger, is associated with higher lifetime alcohol use scores for this sample of 14-18 year-old urban students.

Data suggests that American Indian youth are at increased risk for earlier initiation of alcohol use and higher lifetime illicit drug use, followed by Whites, Hispanics, and African Americans (Cooper et al., 2008; NIDA, 2003). For illicit drug use, American Indians non-Hispanic students had higher but not significantly higher mean *total* lifetime illicit drug use scores than Whites non-Hispanic, Blacks non-Hispanic, and Hispanics. While previous research has

indicated that multiracial adolescents may be at increased risk for at-risk behaviors (Jackson & LeCroy, 2009; Udry, Li, & Hendrickson-Smith, 2003), interestingly, non-American Indian bi/multiracial students had the highest *total* lifetime illicit drug use and American Indian bi/multiracial students had the second to lowest *total* lifetime illicit drug use.

Interestingly, lifetime alcohol use was less at each increasing age of alcohol use initiation category for all students, except American Indian non-Hispanic and American Indian bi/multiracial students. American Indians non-Hispanic and American Indian bi/multiracial students who initiated alcohol use in middle adolescence had higher lifetime alcohol use scores than those who initiated alcohol use younger, in early adolescence (e.g., ages 12 and 13). It may be that the influence of the age of alcohol use initiation on lifetime alcohol use is not as predictable for American Indian students as it is for other students because of unique cultural and socio-economic factors. A number of other factors, including but not limited level of depressive symptoms (Dick, Manson, & Beals, 1993), level of family management (Walls, Whitbeck, Hoyt, & Johnson, 2007), level of sibling antisocial behavior (Waller, Okamoto, Miles, & Hurdle, 2003), level of interaction with antisocial peers (Radin, Neighbors, Walker, Walker, Marlatt, & Larimer, 2006)**,** level of influence by peers and family on substance use (Okamoto, LeCroy, Dustman, Hohmann-Marriot, & Kulis, 2004), and level of gang involvement (Whitbeck, Hoyt, Chen, & Stubben, 2002) are likely influencing lifetime alcohol and illicit drug use among this sample of 14-18 year-old urban American Indian students.

Additionally, it is important to keep in mind that multiracial categorization is socially constructed and fluid among adolescents, including American Indian adolescents (Harris & Sim, 2002; Hitlin, Scott Brown, & Elder, 2006). For instance, American Indian/White adolescents have been found to be particularly likely to be in involved in switching their racial self-categorization across time (Harris & Sim, 2002; Hitlin, Scott Brown, & Elder, 2006). In addition, racial categorization may be related to the socioeconomic status of the neighborhoods and the racial distributions of schools among adolescents (Herman, 2004) as well as societal expectations (Harris & Sim, 2002).

Hypothesis 5

As hypothesized, there were significant gender differences in the age of alcohol use initiation, with American Indian males initiating alcohol use at a significantly younger age than American Indian females. The finding that males have a significantly earlier initiation of alcohol use coincides with what is often found in other research (Grunbaum et al., 2004). In examining the actual mean differences; however, the findings seem to support that the gender gap for the early initiation of alcohol use is narrowing.

Hypothesis 6

For the sixth research question, it was hypothesized that American Indian males would be more likely than American Indian females to report higher lifetime alcohol and illicit drug use. This hypothesis was not supported. There were no significant differences in lifetime alcohol and illicit drug use among American Indian males and females in this study. The results indicate

that American Indian females are using just as much, if not a little more alcohol and illicit drugs as their male counterparts, which also has been found by some researchers with American Indians (Novins, Beals, Shore, & Manson, 1996) and non-American Indian adolescents (National Center on Addiction and Substance Abuse at Columbia University, 2003). Part of the reason for the recent increase in alcohol and illicit drug use could be related to relaxed gender constraints. Parents may be less likely to restrict their daughters' behavior to domestic concerns. Lack of parental monitoring for both male and female children and adolescents likely contributes to greater problems with alcohol and illicit drug use among children and adolescents.

Clinical Implications

The findings from this study have several clinical implications for counseling psychologists and social workers committed to the promotion of mental health among American Indians, and indeed all children, adolescents, and families. Among a large sample of urban American Indian adolescents and their peers, the findings from this study suggest that the earlier the initiation of alcohol use, the higher the lifetime alcohol and illicit drug use in middle and late adolescence. Importantly, while American Indian students in this study were not found to differ from their peers in the early initiation of early alcohol use and lifetime alcohol and illicit drug use, it is not clear if American Indians are similar to their peers or if the findings would have been different in a representative sample of students in Oklahoma County. Further, among American Indian adolescents, American Indian boys are at increased risk of earlier alcohol use

initiation than girls. However, it is clear from this study that the age of alcohol use initiation is only one of many risk factors that influence alcohol and illicit drug use among children and adolescents. For American Indians, for example, Clark and Witko (2006) maintain that many American Indian youth struggle for a sense of cultural identity in the urban environment.

With this study suggesting that the early age of alcohol use initiation is predictive of increasing substance misuse for children and adolescents, culturally affirming prevention programs are imperative. There are not enough behavioral health prevention and intervention services through urban Indian clinics and tribes are oriented toward child behavioral health (Manson & Altschul, 2004). Witko (2002) indicated that few programs in urban areas address the unique needs of urban American Indians. Unfortunately, many of the prevention and intervention services offered are primarily educational in nature and do not focus on the child within a family and community context. In developing prevention and intervention programs, it is important to use a contextual lens in conceptualizing risk and protective factors. While risk and protective factors are grouped in a number of ways (e.g., internal and external factors; community, school, peer, family, and individual factors; interpersonal and intrapersonal factors; individual and contextual factors), it is suggested that most factors are broadly contextual. When factors are identified in categories, such as academic orientation being viewed as an “individual factor,” this discounts other possible contextual influences on academic orientation like poverty and perceived discrimination at school.

Culturally informed approaches from various theoretical orientations to prevent alcohol and illicit drug use have been offered among American Indian adolescents, but not specifically for young children. These include cognitive-behavioral (Renfrey, 1992; Trimble, 1992), teaching bi-cultural competence skills (Schinke, 1985; Schinke, Orlandi, Botvin, Gilchrist, Trimble, & Locklear, 1988), and community approaches (Edwards & Edwards, 1988) such as the Journeys of the Circle Project (Marlatt et al., 2003) and Wellbriety Movement (Coyhis & Simonelli, 2008), focusing on historic cultural traditions. Whitesell, Beals, Mitchell, Keane, Spicer, and Turner (2007) concluded in their study that efforts to help American Indian children and adolescents develop constructive mechanisms for coping with adversity may be especially valuable in substance dependence prevention. In a literature review on American Indian healing practices, Lyness (2002) described a narrative approach to addiction, suggesting that Narrative Therapy may have the most merit (e.g., see Diamond, 2000 for a narrative approach to addiction). Current treatment modalities with urban Indian adolescents have been described by Clark and Witko (2006). Whitbeck (2006) provided some guiding assumptions and a theoretical model for developing culturally competent specific preventions with American Indians.

Finally, this study informs us that prevention needs to begin with young children. While boys were found to be at an increased risk for the early initiation of alcohol use, the actual mean differences were small, suggesting that girls are initiating alcohol use close to that of boys. The above programs and models can certainly guide mental health professionals in the creation of

prevention programs for these groups but special attention must be paid to cultural, developmental, and gender considerations. Bernal and Scharron-Del-Rio (2001) suggested that “it is essential that researchers construct theories of psychotherapy and evaluate treatments grounded in the realities and experiences of ethnic minority populations” (p. 337).

Limitations and Future Directions

This study has a number of limitations. First, because cross-sectional data was used, causal claims about the direction of associations cannot be made. Second, the present study relied exclusively on the use of self-report data which is subject to a host of both random and systematic errors of reporting (e.g., forgetting) (Bachman & O’Malley, 1980; Schwarz, 1999). Third, this researcher used data that was not from a random sample but instead a convenience sample because a number of students in Oklahoma City were not able to participate because some schools elected not to participate in the OPNA survey. Although the OPNA was offered to all schools in the state of Oklahoma, including public, private, and charter schools, not all schools participated (e.g., participation was completely voluntary). In looking over the schools involved in the OPNA survey for Oklahoma County, there was a mixture of public, private, and charter schools. It is unclear if schools/students in particular areas, such as students in lower-income inner city schools did not complete the survey. Fourth, the adolescents in this study were from one geographical location (e.g., Oklahoma County) thus, caution in generalizing the findings to adolescents in other geographic regions ought to be used. Fifth, a

recent report in Oklahoma indicated that American Indian students in grades eight, 10, and 12 in the state of Oklahoma reported greater lifetime alcohol use compared to all races combined (ODMHSAS, 2008a; ODMHSAS, 2008b). This study might have had different findings if this researcher had included all American Indians in the state of Oklahoma instead of just county data. Sixth, students who dropped out of school or were absent from school are not represented in the sample, leaving a more resilient sample of students to complete the survey. Seventh, American Indian adolescents were aggregated into only two groups (e.g., American Indian non-Hispanic and American Indian bi/multiracial), despite their diversity (e.g., tribe). Eighth, there was a restricted range for lifetime alcohol and illicit drug use. Ninth, it has been argued by McDonald (1998) that ANOVA-type analyses that evaluate simple differences between groups, particularly between American Indians and non-American Indians, may be "meaningless and even harmfully misrepresentative" (p. 19). The complexity (Ford & Kelly, 2005; Manly, 2006) and fluidity (Hitlin, Scott Brown, & Elder, 2006) of the race and ethnicity constructs were not captured in the instrument used in this study. In addition, since the research suggests there may be psychological benefits associated with having a multiracial identity and that promotion of these multiple identities ought to be encouraged (Binning, Unzueta, Huo, & Molina, 2009), such as in school settings, for example. Further, McDonald (1998) presented questions for researchers to consider in conducting research with American Indians, asking:

> "Can you keep the best interests of your American Indian subjects in mind when you answer these questions and start writing? Carefully

> consider these issues before publishing any results from studies with American Indian subjects because once in print it's too late. Listen to your heart, mind, spirit, and the spirits of your relatives and ancestors and let them guide you. (p. 19)

In listening to her heart, mind, spirit, and the spirits of her relatives and ancestors to guide her, this researcher feels that she considered the "alcohol and drug problems" among American Indians in a broader neocolonial context and has attempted to be respectful of all people in this study.

Finally, American Indians need to be included more often in the national data sets related to health disparities (Moy, Smith, Johansson, & Andrews, 2006). Longitudinal studies that can identify risk and protective factors can be helpful in understanding substance abuse among American Indian adolescents (Dick, Manson, & Beals, 1993). Future Oklahoma Prevention Needs Assessment surveys would benefit from including a more representative sample of students as well as risk and protective factors for alcohol and illicit drug use that have been found in the literature for ethnic minority youth. This would facilitate the examination of racial/ethnic differences by gender which has been recommended by some researchers (Amaro, Blake, Schwartz, & Flinchbaugh, 2001).

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Appendix A

Table 1

Percentages, Means, and Standard Deviations for Demographic Variables

Variable	%	N	M	SD
Ages (14-18)	100	2248	15.6	1.406
14	31.6	711		
15	15.5	348		
16	27.1	610		
17	10.9	246		
18	14.8	333		
Gender	100	2201		
Male	45.4	999		
Female	54.6	1202		
Grade	100	2248		
6^{th}	.2	5		
8^{th}	37.9	853		
9^{th}	.4	10		
10^{th}	39.3	884		
11^{th}	1.3	29		
12^{th}	20.8	467		
Race/Ethnicity	100	2093		
Hispanic only	16.5	345		
American Indian non-Hispanic	4.4	92		
Black non-Hispanic	13.1	275		
White non-Hispanic	52.4	1097		
American Indian bi/multiracial	6.6	138		
Non-American Indian bi/multi	7.0	146		

Table 2

Percentages for Age of Alcohol Use Initiation by Race/Ethnicity

Age of Alcohol Use Initiation	Race/Ethnicity	%	n
Childhood	American Indian bi/multiracial	35.5	49
	American Indian non-Hispanic	28.3	26
	Non-American Indian bi/multiracial	28.1	41
	Black non-Hispanic	27.6	76
	Hispanic only	27.0	93
	White non-Hispanic	26.3	288
Early adolescence	Black non-Hispanic	34.9	96
	American Indian non-Hispanic	33.7	31
	Non-American Indian bi/multiracial	30.8	45
	Hispanic only	29.6	102
	American Indian bi/multiracial	29.0	40
	White non-Hispanic	28.1	308
Middle adolescence	White non-Hispanic	45.7	501
	Hispanic only	43.5	150
	Non-American Indian bi/multiracial	41.1	60
	American Indian non-Hispanic	38.0	35
	Black non-Hispanic	37.5	103
	American Indian bi/multiracial	33.5	49

Note. Childhood = ages 11 or younger, Early adolescence = ages 12 and 13, and Middle adolescence = ages 14–18

Table 3

Means, Standard Deviations, and Intercorrelations for all Variables

Variable	M	SD	1	2	3
1. Age of Alcohol Use Initiation	12.89	1.958	--	-.132**	-.196**
2. Lifetime Alcohol Use	4.36	1.828		--	.359
3. Lifetime Illicit Drug Use	19.06	12.978			--

**p < 0.01 (one-tailed)

Note. 1. Age of Alcohol Use Initiation, lower scores indicate younger age of initiating alcohol use; 2. Lifetime Alcohol Use score, higher scores indicate higher lifetime alcohol use (1-7); 3. Lifetime Illicit Drug Use score, higher scores indicate higher lifetime Illicit Drug Use score (includes the addition of 12 separate illicit drugs) (7-84)

Table 4

ANOVA for the Regression Equation, Age of Alcohol Use Initiation on Lifetime Alcohol Use

	Sum of Squares	df	Mean Square	F
Regression	131.227	1	131.227	39.941**
Residual	7379.221	2246	3.285	
Total	7510.448	2247		

**p < 0.01

Table 5

ANOVA for the Regression Equation, Age of Alcohol Use Initiation on Total Lifetime Illicit Drug Use

	Sum of Squares	df	Mean Square	F
Regression	14019.330	1	14019.330	86.507**
Residual	352316.663	2174	162.059	
Total	366335.993	2175		

**p < 0.01

Table 6

*ANOVA – Lifetime Alcohol Use and Race/Ethnicity * Age*

	Sum of Squares	df	Mean Square	F
Race	136.050	5	27.210	8.435**
Age	115.072	2	57.536	17.837**
Race*Age	60.745	10	6.074	1.883*
Error	6693.399	2075	3.226	
Total	46977.000	2093		

*p<0.05 **p < 0.01

Table 7

ANOVA – Lifetime Alcohol use and Age of Alcohol Use Initiation

	Sum of Squares	df	Mean Square	F
Age	131.195	2	65.598	19.957**
Error	7379.253	2245	3.287	
Total	7510.448	2247		

**p < 0.01

Welch – Lifetime Alcohol Use and Age of Alcohol Use Initiation

Statistic	df1	df2
18.850**	2	1378.488

**p < 0.01

Table 8

ANOVA – Lifetime Alcohol Use and Race/Ethnicity

	Sum of Squares	df	Mean Square	F
Race	128.917	5	25.783	7.809**
Error	6890.594	2087	3.302	
Total	7019.511	2092		

**p < 0.01

Welch – Lifetime Alcohol Use and Race/Ethnicity

Statistic	df1	df2
.015**	5	428.084

**p < 0.01

Table 9

*ANOVA – Total Lifetime Illicit Drug Use and Race/Ethnicity * Age of Alcohol Use Initiation*

	Sum of Squares	df	Mean Square	F
Race	3762.254	5	752.451	4.706**
Age	6048.795	2	3024.397	18.914**
Race*Age	2321.776	10	232.178	1.452
Error	321243.631	2009	159.902	
Total	46977.000	2093		

*p<0.05 **p < 0.01

Table 10

ANOVA – Total Lifetime Illicit Drug Use and Age of Alcohol Use Initiation

	Sum of Squares	df	Mean Square	F
Age	12171.707	2	6085.854	37.340**
Error	354164.286	2173	162.984	
Total	366335.993	2175		

**p < 0.01

Welch – Total Lifetime Illicit Drug Use and Age of Alcohol Use Initiation

Statistic	df1	df2
27.327**	2	1214.168

**p < 0.01

Table 11

ANOVA – Total Lifetime Illicit Drug Use and Race/Ethnicity

	Sum of Squares	df	Mean Square	F
Race	2805.160	5	561.032	3.372**
Error	336261.008	2021	166.383	
Total	339066.168	2026		

**p < 0.01

Welch – Total Lifetime Illicit Drug Use and Race/Ethnicity

Statistic	df1	df2
.629**	5	421.239

**p < 0.01