Alcohol Use and Misuse among American Indians:

Applying a Modified Historical Trauma Model

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Abstract

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Although Native Americans are commonly associated with alcohol misuse, little is known about stressors or coping mechanisms that may influence alcohol use patterns. Using Wave 2 of the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC), a nationally representative data set, I examine patterns of drinking status, frequency and actual consumption of specific alcoholic beverage preference, and binge drinking. To better explain these relationships, I will investigate the influence of stressors and coping mechanisms in the context of a modified historical trauma model. Stressors include adverse childhood experiences, family dysfunction during childhood, receiving welfare as a child, having an alcoholic biological parent, and perceived racial discrimination. Coping mechanisms such as high ethnic identification, preference for other Native American peers, preference for using a native language, level of social support, and social network size are also examined. While there is some evidence certain stressors increase the risk of being a current drinker relative to lifetime abstainers, the modified trauma model is limited in its ability to explain American Indian drinking behavior.

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CHAPTER 1: INTRODUCTION

According to the CDC, drinking alcohol affects every organ in the body (2012). Despite previous research suggesting that red wine supports heart health, a new study linking alcohol and cancer claims that alcohol causes ten deaths for each one it prevents (Nelson et al. 2013). This study finds that up to 3.7% of cancer deaths in the United States are attributable to alcohol. These cancers reduced potential years of life in these deaths from 17 to 19.1 years. In addition to causing premature death, excessive consumption of alcohol increases the risk of disease and injury. Alcohol use also has significant influence on the safety and well-being of others. Excessive alcohol consumption is associated with crime, lost productivity, and property damage from alcohol-related vehicle accidents and fires (Bouchery et al. 2011).

American Indians and Alcohol

In addition to the harm caused to the body when drinking, alcohol is also a contributing factor to self-harm. Alcohol is named the "lubricant to suicidality" by Ali and colleagues (2013). These scholars summarize research citing the progression from alcohol use to damage of the hippocampus, which increases self-destructive behavior, ultimately ending in suicide. Another review links alcohol to suicidal behavior through impaired judgment and impulsiveness, in addition to easing distress regarding committing suicide (Pompili et al. 2010). The relationship between alcohol and suicidal behavior is more pronounced for American Indians, since this group has higher rates of alcohol abuse and alcohol-related suicide than Whites (Keyes and Cernda 2013). Among suicide decedents, American Indians also have the highest blood alcohol content (Caetano et al. 2013).

The effects of alcohol are particularly severe for American Indians in other aspects, as well. American Indians and Alaska Natives are known for being at increased risk for poor health outcomes, including obesity, diabetes, fair to poor general health, cigarette smoking, and binge drinking (Denny and Taylor 1999). In 2001-2002, 23.4 million adults reported drinking and driving behaviors in the United States, with Native Americans men and women being at greatest risk compared to other racial/ethnic group for these behaviors, including both driving and passenger-based incidents (Chou et al. 2006). The result of these alcohol-related behaviors is over 20% of total indigenous deaths attributable to alcohol, with the rate for males surpassing 25%, compared to only 12% of White male deaths (Shield et al. 2013).

Although research consistently suggests a link between American Indians and alcohol use, American Indians are unfairly associated with stereotypes of the "drunken Indian" and "firewater myths." Research has established these stereotypes are false, both historically and contemporaneously. Ehlers et al. (2013) dispel these myths using data from the Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA), in favor of a hypothesis that post-traumatic stress disorder (PTSD), trauma, and substance dependence emerge simultaneously in early adulthood for American Indians. Many scholars consider the genocide of Native Americans and tribal culture evidence of historically unresolved grief or historical trauma. These persistent myths may also be a form of stigma resulting from historical trauma. This legacy of cultural loss has been theorized to perpetuate detrimental outcomes for Native Americans including: "high rates of suicide, homicide, domestic violence, child abuse, alcoholism, and other social problems" (Brave Heart and DeBruyn 1998: 60). Historical loss is often cited as a possible explanation for the propensity to misuse alcohol, though this concept is difficult to test empirically (Walters, Simoni, and Evans-Campbell 2002). The National

Epidemiologic Survey of Alcohol and Related Conditions (NESARC) provides a unique opportunity to tackle some, but not all, of these measures related to the detrimental effects of historical trauma and subsequent alcohol use.

Current State of Native Americans

Throughout this work, the terms "Native American," "American Indian," and "indigenous" are used interchangeably. Although the term "Native American" gained popularity in academic circles in the 1970s, some groups find this usage confusing since anyone born in the United States is a "native" American. The usage of "American Indian" or "Indian" is also questioned because this term is a misnomer. A study in the mid-1990s found that 50% of respondents identifying as indigenous prefer the term "American Indian," compared to 37% preferring "Native American" (Clyde, Kojetin, and Harrison 1995). The term "American Indian" is officially endorsed by the National Tribal Chairman's Association and the National Congress of American Indians (Brave Heart et al. 2011). When possible, it is preferable to refer to a person by their tribal affiliation (e.g. Creek, Cherokee, Navajo) rather than one of the broader terms.

The Bureau of Indian Affairs describes American Indians and Alaska Natives on their official website (2013) in the following way:

> As a general rule, an American Indian or Alaska Native person is someone who has blood degree from and is recognized as such by a federally recognized tribe or village (as an enrolled tribal member) and/or the United States. Of course, blood quantum (the degree of American Indian or Alaska Native blood from a federally recognized tribe or village that a person possesses) is not the only means by which a person is considered to be an American Indian or Alaska Native. Other factors, such as a person's knowledge of his or her tribe's culture, history, language, religion, familial kinships, and how strongly a person identifies himself or herself as American Indian or Alaska Native, are also important. In fact, there is no single federal or tribal criterion or standard that establishes a person's identity as American Indian or Alaska Native.

An individual's sense of identity as a Native American is even more complicated than this definition, since they may feel that lacking cultural knowledge and/or blood quantum make them less native than others. Even though the number of single-race American Indians is declining, the general population has been increasing since the 1950s when the census began to allow for self-identification for this racial classification. Kelly and Nagel (2002) describe this phenomenon as ethnic re-identification, marked by renewed self-identity and participation in ethnic activities.

According to the 2011 American Community Survey, Native Americans comprise 1.6 percent, or 5.1 million, of the population, with half of these individuals reporting only Native American heritage. The American Indian Population and Labor Force Report conducted by the BIA report that fewer than half of individuals self-identifying as Native American in 2007 are tribally enrolled (BIA, 2013). There are 566 Federally recognized tribes in the United States, with nearly 20% of Native Americans living in Alaska, followed by 13.3 % in Oklahoma, 10.4% in South Dakota, and 10.4% in New Mexico. Almost 30% of Native Americans over the age of five speak a language other than English at home. (U.S. Census Bureau, 2007-2011 American Community Survey). These statistics suggest that American Indians are a diverse racial group.

Research Questions

In an effort to gain a more comprehensive view of contemporary American Indians and alcohol use, I will investigate the progression of alcohol use through the decision to drink, what to drink, and how much to drink. Using the Historical Loss model (Walters et al. 2002), the Stress Process model (Pearlin et al. 1981), and the Adverse Childhood Experiences (ACE) pyramid (Dube and Felitti 1998), I will test factors associated with stressors and coping mechanisms. First, I examine factors influencing an individual to be a lifetime abstainer, a

former drinker, or a current drinker. I will then examine specific alcoholic beverage decisions, including beverage preference and actual consumption. Finally, I will examine rates of binge drinking. The following chapter describes the research foundations, including the development of the conceptual model and literature review.

CHAPTER 2: RESEARCH FOUNDATIONS

This chapter provides a more detailed account of the history of American Indians and alcohol. It will also describe an existing model of stress and coping specific to Native Americans, as well as introduce a modified version utilized in this dissertation. A literature review of the main themes in this dissertation is also in this chapter.

Introduction of Alcohol

The relationship between Native Americans and alcohol began with European contact, occurring in the 16th century for tribes along the East Coast and as late as the mid-19th century for Western and Midwestern tribes. According to Frank et al. 2000:

> Initially, Native Americans' responses to alcohol were heavily influenced by the example of White frontiersmen, who drank immoderately and engaged in otherwise unacceptable behavior while drunk. Whites also deliberately pressed alcohol upon the natives because it was an immensely profitable trade good; in addition, alcohol was used as a tool of 'diplomacy' in official dealings between authorities and natives. (P. 344)

Beauvais (1998b) contends that the exposure to European drinking habits occurred so quickly that American Indians did not have time to develop social, moral, or legal guidelines for use. Problematic drinking as a learned behavior occurred in three phases. The first phase is "precontact culture: mind-altered states as a social good (Frank et al. 2000:345)." Before the introduction of alcohol, mind-altering states occurred in a cultural context for the purpose of the good of the group, including quests for enlightenment, healing powers, and war-making. According to Cohyis and White (2002), some tribes even used fermented alcohol in this context before European contact. The second phase marked "initial contact" (Frank et al. 2000:345). Though this period is poorly documented, the authors suggest a brief period of peace occurred in which drinking was relatively harmless and not associated with violence or antisocial behavior. Next, the third phase signified the "development of new native drinking cultures" (Frank et al.

2000: 346). As exposure to European frontiersmen continued, collective binge drinking became more common and widespread throughout various tribes. Early observers generalized six main characteristics regarding the evolution of alcohol use into problematic behavior: 1) drinking in groups rather than alone, 2) drinking until the alcohol was gone, regardless of how much one had already consumed, 3) lack of social controls, even pressure for group members to drink with no limits, 4) violence during binges, usually toward family and other tribal members rather than enemies or the settlers, 5) lack of individual blame or remorse for behavior while drinking, and 6) "near-demonization" of alcohol as an agent of harm (Frank et al. 2000). Alcohol became a tool of sexual, political, and economic exploitation as tribes came under cultural and physical attacks.

Along with European contact and the introduction of alcohol to indigenous people, the population rapidly declined due to three main factors: genocide, warfare, and epidemic disease. Diseases such as cholera, diphtheria, influenza, smallpox, and typhus were deadly to the American Indian population because they had no immunity. Some settlers viewed this devastation to indigenous people as evidence of God's favor. Warfare with other tribes and with Europeans claimed somewhere between 150,000 to 500,000 lives. The full impact of this genocide on American Indian life is hard to estimate. Forced removal from tribal lands including the "Trail of Tears" was followed by encouraging assimilation through pressuring indigenous people into farming and boarding schools to extinguish cultural traditions.

Historical Trauma

The impact of this history exists in contemporary indigenous people. Historical Trauma (HT) is a concept developed by Brave Heart et al. (2011) and defined as "a cumulative emotional and psychological wounding across generations, including the lifespan, which emanates from

massive group trauma" (283). Other terms to describe this phenomena include "collective trauma", "intergenerational trauma," and "multigenerational trauma" (Evans-Campbell 2008: 320). This theory developed from reports of lingering trauma on Holocaust survivors, which in turn, influenced future generations from survivors' parenting practices. Whitbeck et al. (2004a) point out many differences between Holocaust survivors and Native Americans. First, Native Americans had no home to return to, their way of life and survival were eradicated, and there was no end to the ongoing and legal ethnic cleansing. Further, this trauma stretched through generations, with "daily reminders of loss: reservation living, encroachment of Europeans on even their reservation lands, loss of language, loss and confusion regarding traditional religious practices, loss of traditional family systems, and loss of traditional healing practices" (121).

Historical trauma is transmitted through generations, with descendants identifying with the ancestral loss. Although historical trauma may be operationalized in different ways, three main characteristics are prevalent in the literature. First, the event is widespread throughout the community. Next, the shared event causes collective distress in the community. The third critical component of historical trauma is that the event is instigated from the outside with malicious intent (Evans-Campbell 2008). Similarly, Palacios and Portillo (2009) describe four key components of historical trauma. First, a traumatic event with devastating effects must occur. Second, the individual must survive the event. Third, first-generation survivors of the event evaluate the trauma, and may suffer painful flashbacks, anxiety, grief, or PTSD. The fourth and final assumption is that these traumas are transmitted to future generations through parenting practices.

Whitbeck and colleagues (2004a) created a scale of perceived loss, demonstrating that despite being removed by generations, parents and caretakers of children aged ten to twelve still

think about these losses. The most notable concern of today's Native American adults is the prevalence of the effects of alcohol on their society. Over 90% of the sample of respondents living on two reservations in the Midwest U.S. or two in Canada think about the effects of the losses from alcohol in a given year, with over 45% considering these effects at least daily. Around 90% of this sample considers the loss of language, spiritual ways, and culture at least yearly or during special times. However, 44.3% of this sample never thinks about the impact of boarding schools on family ties, 52.2% never considers the impact of government relocation to reservations on the loss of families, and 25.2% never thinks about the loss of tribal land. Respondents may feel less connected to these events occurring in the past, but the impact of their legacy is shown in how they feel perceive other forms of loss. In a qualitative study of the Navajo tribe, parents and youths report feeling less connected to a historical narrative than grandparents. Parents were more concerned with current violence in their communities than historical events, though the authors (Goodkind et al. 2012) suggest that these experiences are linked.

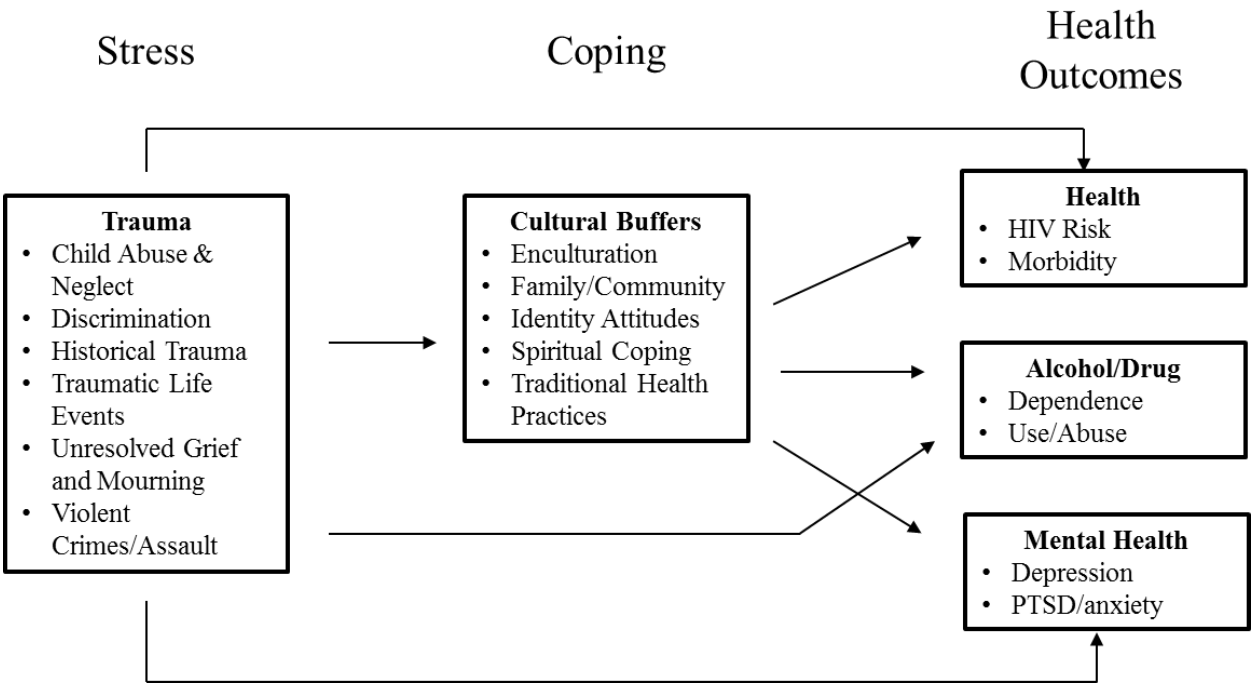

Figure 2.1 Conceptual Model of Historical Trauma

SOURCE: Walters, Simoni, and Evans-Campbell (2002). Figure 1. (p. S106)

Figure 2.1 above outlines Walters and colleagues' (2002) conceptual model of historical trauma. Some of the stressors such as unresolved grief and mourning and historical trauma are difficult to operationalize. Similarly, few nationally representative data exist that can capture the cultural buffers listed under coping mechanisms. In this dissertation, I will use variables that capture preference for other American Indians as peers, preference for a native language over English, and strength of ethnic identity. Although Walters et al.'s (2002) conceptual model of historical trauma is based on the stress-coping model by Pearlin et al. (1981), it does not account for the moderating effects of coping mechanisms. According to Pearlin, involuntary traumatic life events adversely affect role strains, which in turn harm self-esteem and mastery, leaving

individuals vulnerable to adverse outcomes. However, coping mechanisms and social support work indirectly to lower the harmful effects of stress.

To better merge these concepts, I adopt a modified version of this conceptual model, testable with available data, that I will call the Modified Trauma for American Indians model. I am unable to conceptualize historical trauma and unresolved grief directly in the NESARC. However, it is possible that these abstract concepts are evident in childhood and current stressors, passed through generations. Although measures regarding violent crimes/assault are available in the NESARC, I have excluded them in this dissertation in favor of more detailed traumatic childhood experiences. I draw heavily from measures used in the Adverse Childhood Experiences Study, which goes beyond the measures of child abuse and neglect suggested in Walters et al.'s (2002) model.

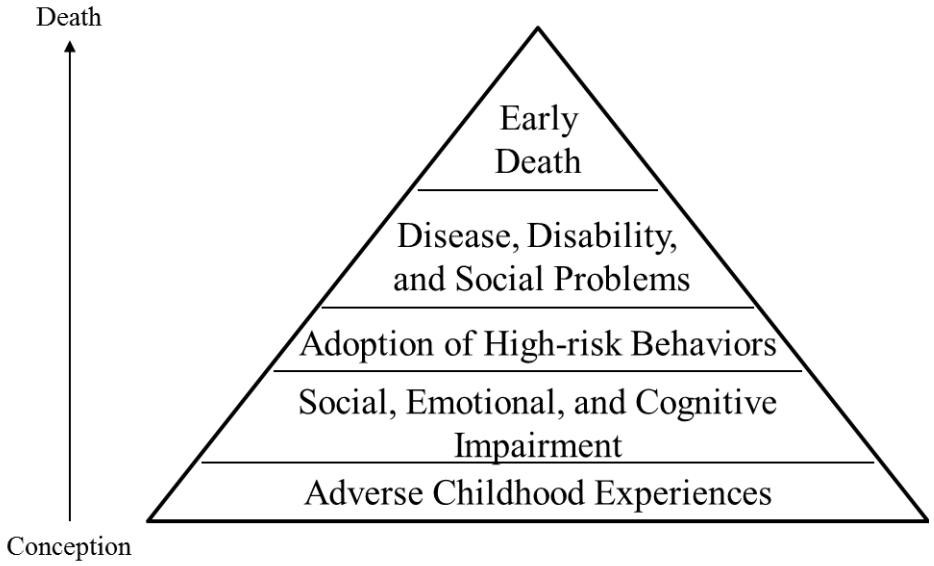

Figure 2.2 Adverse Childhood Experiences Study Pyramid

Source: Anda and Felitti (1998). Acestudy.org

The ACE study provides evidence that traumatic childhood experiences, including various types of abuse and neglect, lead to poorer health outcomes, through the process indicated above. These variables are more easily measured and are available in wave 2 of the NESARC. Other measures of disadvantage not captured by ACEs, but indicative of dysfunctional households are also in my model as stressors. These factors are described below.

Modified Trauma Model for American Indians

Combing elements of Walters et al.'s (2002) conceptual model of historical trauma, Pearlin et al.'s (1981) stress and coping model, and Anda and Felitti's (1998) ACE pyramid allows me to create a new, testable model for American Indians. I will use this model to examine alcohol use and misuse outcomes, specifically. In this new model, depicted in Figure 2.3, historical trauma leads to both childhood and current stressors. Stressors experienced in childhood include adverse childhood experiences (i.e., physical neglect, verbal abuse, physical abuse, sexual abuse, and witnessing aggression toward one's mother), household dysfunction (i.e., having a parent or caregiver in the household with a problem with alcohol, a problem with drugs, a history of incarceration, a history of mental illness, a history of suicide attempts, or who committed suicide), and receiving welfare as a child. Current stressors include experiencing perceived racial discrimination in the past year and having a biological parent with an alcohol problem. This biological also serves as a proxy for genetic predispositions toward alcohol use and misuse. Each of these experiences may lead to poorer health outcomes as adults.

Coping is a process by which people do things to avoid being hurt by events in one's life, and is an integral part of this model. Pearlin and Schooler (1978) describe the protective functions of coping occurring in three ways: "by eliminating or modifying conditions giving rise

to problems; by perceptually controlling the meaning of experience in a manner that neutralizes its problematic character; and by keeping the motional consequences of problems within manageable bounds (p. 2)." Testing this theory in an empirical study, Pearlin et al. (1981) find that the effects of coping are indirect, reducing the impact of the stressor(s). Walters et al. (2002) characterizes these coping mechanisms as cultural buffers. In my model of modified trauma for American Indians, I include positive coping mechanisms enculturation (i.e., preference for a language other than English, preference for same-race peers, and strength of ethnic identity), social support, and social network (i.e., close ties and instrumental ties). Many of these measures align with Walters et al.'s (2002) model, with close social ties and instrumental ties measures being analogous to family and community, respectively. I also include a separate, explicit measure of social support. I am not able to measure spiritual coping or traditional health practices. As shown in the model, historical trauma may positive impact enculturation, while simultaneously decreasing social support.

This model also includes a proposed moderating effect of positive coping mechanisms on the effect of stress on drinking behaviors, as shown with the grey dotted lines. This approach is based on Pearlin et al.'s (1981) model. Although Walters et al.'s (2002) model labels coping mechanisms as buffering effects, they do not include the interaction. If coping mechanisms do buffer the effects of stress, American Indians with higher levels of these coping mechanisms will be less impacted by stressors than those with lower levels.

This modified model focuses on three main alcohol use outcomes, with an analytical chapter devoted to each one. First, the decision to drink in Chapter 5, specific beverage preference and consumption in Chapter 6, and finally binge drinking in Chapter 7. These chapters build on each other to develop a more comprehensive view of alcohol use patterns. This

modified model is the basis for explaining American Indian alcohol use throughout this dissertation.

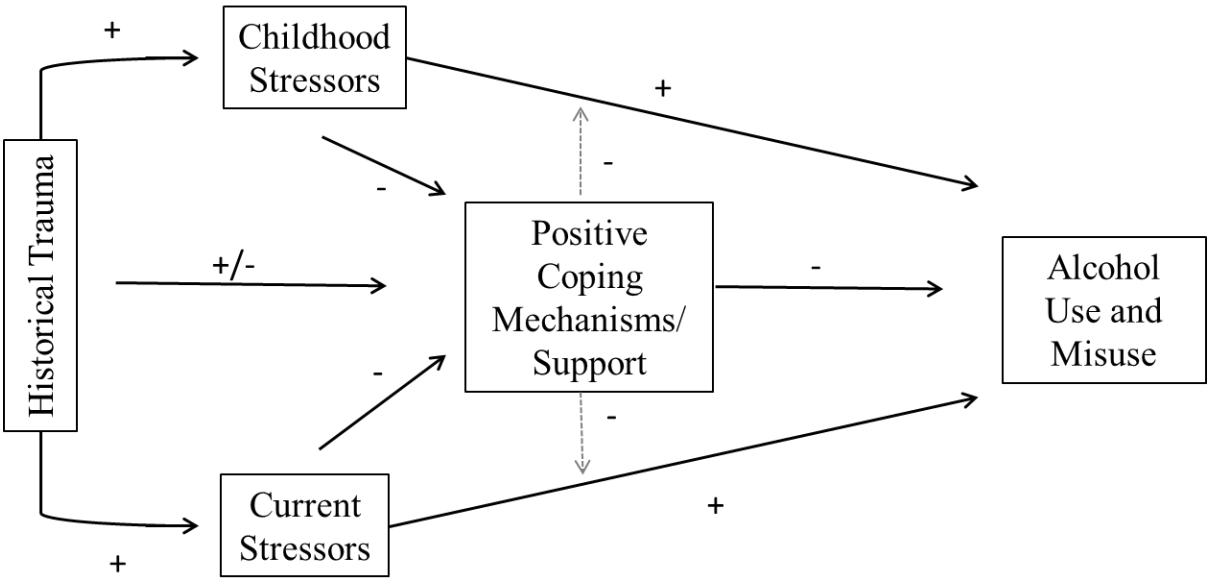

Figure 2.3 Conceptual Model- Modified Trauma for American Indians

Literature Review

I now provide a literature review of these concepts, including how they are generally seen in existing research and, when possible, how they relate specifically to Native Americans. This review corresponds to the measures in the model of Modified Trauma for American Indians as shown above. These measures are operationalized and described in a later chapter.

Adverse Childhood Experiences and Household Dysfunction

Although I will analyze ACEs and household dysfunction as separate measures, many studies mix and match aspects of each for their analyses. Therefore, in this overview, I will specify which factors were included in the study as I discuss existing literature. Although childhood events are subject to recall error, a test-retest reliability study of the ACE study finds

that each category of abuse and dysfunction are in good agreement (Dube et al. 2004). Similarly, Hardt, Vellaisamy and Schoon (2010) determined from an examination of the British National Child Development study, a longitudinal cohort study, and the Mainze Adverse Child Experiences (Germany), a retrospective study, that bias is not a concern in retrospective studies. These measures were also tested for reliability in the NESARC (Ruan et al. 2008).

There is substantial evidence of ACEs and household dysfunction contributing to alcohol use and misuse, as well other poor health outcomes. Dube et al. (2003) find evidence of a significant, graded increased risk for six adverse health outcomes: depression, attempted suicide, sexually transmitted diseases, multiple sexual partners, alcoholism, and smoking. In this study, childhood emotional, physical, and sexual abuse were measures of ACEs, while exposure to a household member with substance abuse problems, mental illness, criminal behavior, parental separation or divorce, or exhibited violence toward the respondent's mother are considered measures of household dysfunction. Experiencing ACEs and household dysfunction also results in a 1.4 to 1.6 fold increase in physical inactivity and related severe obesity (Felitti et al. 1998). ACEs in this study are defined as physical, psychological, or sexual abuse; living with household members who were imprisoned, suicidal or mentally ill, or abused substances.

ACEs and household dysfunction are also linked to other negative health outcomes. HIV infection among men is linked to experiencing adverse childhood experiences, which in this study are referred to as early life stressors, including neglect, witnessing violence, physical abuse, verbal violence, or sexual abuse (Reisner, Falb, and Mimiaga 2011). Among participants sampled from a Los Angeles drug abuse treatment program who were also seeking mental health services, greater exposure to childhood traumatic events (i.e., emotional abuse, physical neglect, physical abuse, sexual abuse, family violence, parental divorce or separation, incarcerated family

member, out of home placement, and death of someone close), significantly increased the odds of medical problems, diminished quality of life, PTSD, sex work, alcohol dependence, tobacco use, and injection drug use (Wu et al. 2010). Anda et al. (2002a) found that men who experienced five or more of the following events are more likely to impregnate a teenager than someone who did not experience any of the events: verbal abuse, physical abuse, sexual abuse, battered mother, household substance abuse (alcohol or drug), mental illness in the household, parental separation or divorce, or a criminal household member.

Childhood trauma is linked to alcohol use disorders for individuals with and without PTSD (Fetzner et al. 2011). In a study of homeless individuals from New York and California, adverse childhood experiences including living with sexual abuse, running away from home for longer than seven days, being arrested, using drugs or alcohol regularly, being homeless, or a history of living in foster care, group home, or other placement outside the home are often precursors to subsequent alcohol and substance use, which in turn reduce labor force participation (Tam, Zlotnick, and Robertson 2003). Another study using this sample of homeless adults finds that adverse childhood experiences are significantly associated with drug use in adulthood, but not alcohol use (Zlotnick, Tam, and Robertson 2004). Experiencing emotional abuse, physical abuse, sexual abuse, a battered mother, household substance abuse, parental divorce or separation, or having a household member in jail is associated with depressive disorders in adulthood (Chapman et al. 2003). In Chapman's study, mental illness in the household was controlled separately given the nature of the outcome variable.

Dube and colleagues (2002b) report that respondents with parents who abused alcohol were significantly more likely to experience all of the following ACEs: emotional abuse, physical abuse, sexual abuse, parental separation or divorce, witnessing domestic violence, or

living in a household with substance users, criminals, mentally ill, or suicidal members. According to Dube et al. (2001), individuals with parents who abused alcohol are 2 to 13 times more likely to experience child abuse, neglect, or household dysfunction (defined as having a battered mother, an adult in the household with a substance abuse problem, mental illness in the home, separation or divorce of parents, or having an incarcerated member of the household in this study). Homes with alcoholic parents might be more prone to ACEs.

Adolescents who experienced sexual abuse, physical abuse, or witnessed domestic violence are significantly more likely to initiate alcohol use as a teen (Hamburger, Leeb, and Swahn 2008). Another study of high school seniors finds that adolescents subject to ACEs had significantly worse outcomes in depressive symptoms, anti-social behavior, and drug use two years later (Schilling, Aseltine, and Gore 2007). ACEs in this study are defined as a child being sent away, witnessing injury or a murder, parents separated, parent substance problem, physical assault, physical abuse, serious neglect, parental unemployment, or being threatened or held captive. Rothman et al. (2008) report that experiencing sexual abuse, physical abuse, parental divorce or discord, having a substance user in the home, or having a household member with a mental illness significantly increase the odds ratio of initiating alcohol consumption before the age of 15, compared to initiation after 21 years. Emotional neglect and emotional abuse increased the odds ratio marginally.

The effects of ACEs have also been investigated specifically in the Native American community. In a study of seven tribes, the likelihood of alcohol dependence increased for men who had experienced both sexual and physical abuse as children, while the likelihood increased for women after experiencing sexual abuse or attending boarding school (Koss et al. 2003). ACEs in this study included parental alcoholism, out-of-home placement, and child abuse (i.e.,

physical abuse, sexual abuse, emotional abuse, physical neglect, and emotional neglect). Indigenous incarcerated women in New Mexico with higher incidence of ACEs (physical neglect, witnessed domestic violence, sexual abuse, physical abuse, and dysfunctional family members who were incarcerated, abused substances, or were suicidal or mentally ill) are also associated with intimate partner violence, violent offenses, and suicide attempts (De Ravello, Abeita and Brown 2008). Another study focusing on a Native American sample finds that parental alcoholism, sexual abuse, and physical and sexual abuse increase the odds ratio of physical assault of adult females, while physical and sexual abuse and emotional abuse increase odds ratio of physical assault for males (Yuan et al. 2006).

Further, Neault et al. (2012) assert that alcohol and other substance abuse obstructs "ideal fatherhood roles" across multiple generations for Native American men. The authors argue that intervention targeted at young fathers may help disrupt this pattern. This disruption may also be evident in measures of adverse childhood experiences and household dysfunction.

Discrimination

Discrimination against racial minorities is linked to "a broad range of health conditions, ranging from violence, sexual problems, and poor sleep quality to elevated risk for increased C-reactive protein levels, high blood pressure, and coronary artery calcification, breast cancer incidence, uterine myomas (fibroids), and subclinical carotid artery disease" (Williams 2012:285). Among employed African Americans, experiencing racial discrimination directly influences problem drinking, regardless of socioeconomic attainment (Martin, Tuch, and Roman 2003). Yip, Gee, and Takeuchi (2008) discovered that the effect of discrimination and psychological distress is buffered by ethnic identity for 41 to 50 year old U.S. born Asians, while it is exacerbated by ethnic identity for younger and older adults. Furthermore, racial/ethnic

discrimination increases the log odds of current smoking among Asian Americans. However, perceived racial discrimination had only contemporaneous effects on lower levels of well-being of African American youth, rather than longitudinal effects (Seaton et al. 2011).

For American Indians specifically, discrimination is often very overt and persistent, such as in the case of team mascots (Whitbeck et al. 2004b). American Indians are the only ethnic group to still be used as sports chants, team mascots, with frequent derogatory language on location names. Steinfeldt et al. (2010) provide evidence that "the presence of Native-themed mascots, nicknames, or logos can negatively impact the psychological well-being of American Indians" (p. 362).

A study on American Indian 5th through 8th graders living in the upper Midwest reveals that although perceived discrimination contributes significantly to instances of internalizing symptoms, the relationship between discrimination and substance abuse is mediated by other factors such as anger and delinquent behaviors (Whitbeck et al. 2001). American Indians and individuals of mixed American Indian and White heritage report discrimination in health care more often than Asians, Whites, and African Americans (Johansson, Jacobsen and Buchwald 2006). A longitudinal study of indigenous adolescents finds that discrimination directly and indirectly affect early risky alcohol use (Cheadle and Whitbeck 2011).

In addition, American Indians who already abuse drugs and alcohol cite discrimination as a contributing factor. Twelve of thirteen participants in a culturally specific sobriety program for Native Americans report that they felt a connection between their problem drinking and the "desire to numb themselves from the cumulative stress related to historical trauma, as well as ongoing racism and discrimination" (Myhra 2011: 24). A similar relationship among Latino

adolescents living in the southwest region of the United States is established, wherein perceiving racial discrimination is associated with more frequent and greater quantities of substance use (Kulis, Marsiglia, and Nieri 2009).

Alcoholic Biological Parent

Although no causal link is established, Dube et al. (2001) suggest that having a parent with an alcohol problem is highly associated with experiencing other forms of adverse childhood experiences and household dysfunction. The association between having an alcoholic parent and domestic violence is especially strong. Individuals "experiencing childhood emotional, physical, and sexual abuse; witnessing domestic violence; parental separation or divorce; and growing up with drug-abusing, mentally ill, suicidal, or criminal household members" were significantly more likely to report alcoholic parents (Anda et al. 2002: 1001). IN addition to increasing the risk of ACEs, alcoholic parents may also influence drinking initiation in youth. Specifically, Walls et al. (2007) find that binge drinking by a female caretaker is linked to early Native American youth onset of alcohol use. Another finding from the ACEs study (Dube et al. 2002) concludes that ACEs increase the risk of adult alcohol use, regardless of parental alcohol use. These studies suggest an indirect path from alcoholic parents to alcohol misuse as an adult, though a direct path is also possible. Among adult children (college students) of alcoholics with a history of ACEs, parental alcoholism had only indirect effects, rather than independent effects, on adult adjustment (Harter and Taylor 2000). This same study found no increased co-occurring histories of alcoholic parents and sexual, physical, or emotional abuse.

The notion that indigenous people are genetically predisposed to alcohol use and misuse is largely debunked. In 1997, neuropharmacologists provided evidence against the "firewater" myth, suggesting that Mission Indian men are actually less sensitive to the effects of alcohol

(Garcia-Andrade, Wall, and Ehlers).When examining alleles in a Native American population living near a reservation, rather than finding a genetic predisposition to misuse (measured by allele named ADH1C,), researchers found alleles that serve a protective factor (named ADH1B*3) for only 4% of the sample (Ehlers, Liang, and Gizer 2012). Despite these findings of protective biological factors in a very small portion of indigenous populations, Ehlers and Gizer (2013) conclude that Native American substance abuse is generally likely due to a combination of factors including lack of genetic protective factors, mediated risk factors such as drive for consumption or tolerance, and environmental factors such as exposure to trauma.

Enculturation

Cultural barriers and coping mechanisms against these stressors could lead to better health outcomes and reduce the negative impact of stress. Generally enculturation is discussed in the context of immigrants from other countries assimilating into the host country's culture. Foreign immigrants are often thought to be protected by the "healthy immigrant effect" which suggests that immigrants who maintain old health behaviors are healthier than those who adapt behaviors of their host country (Gushulak 2006). This phenomenon can also occur among Native Americans, particularly those living on reservations as they struggle to find a balance between their tribal culture and mainstream American culture. Preference for a language other than English (assumed here as an indigenous language), preference for same-race (American Indian) peers, and strength of racial identity are components of enculturation.

Studies of racial homophily, or social preference for same-raced peers, have focused on social networks through adolescence and adulthood, friendship, and marriage. These authors argue that racial homophily is a product of 1) ethnic-homophily and aggregation of sub-ethnic groups, 2) increased by friendship reciprocity and meeting same-race friends through other

same-race friends and 3) socioeconomic, regional and cultural tastes (Wimmer and Lewis 2011). They find a direct relationship between racial backgrounds and racial homophily in networks on Facebook, particularly for African American college students. Similarly, in a "newcomer" setting of first year MBA students, Mollica, Gray and Trevino (2003) find that race homophily is more salient for African American students than Hispanics and whites. In my conceptual model, I consider preference for American Indian peers to be a protective measure.

However, some research finds that more enculturated individuals are more prone to encounter danger. Women with greater retention for a tribal language are at increased risk of being physically assaulted, and women with stronger tribal identity have a greater chance of being raped. Yuan et al.'s (2006) study suggests the increased risk in victimization corresponds with violence in American Indian communities coming from family members and romantic partners. It is possible that these findings are based on samples living on reservations, which may be more prone to poverty and violence.

Members of the Native American community often develop a sense of identity and culture through experiencing racism (Mhyra 2011). The issue of the racial identity of indigenous people is complex. For a review of scales measuring American Indian identity, see Garrett and Pinchette (2000). This group's assimilation into mainstream society was involuntary. Indigenous people were removed from their lands, and had the culture beliefs and practices of the majority forced upon them. Boarding schools disrupted the passing of culture and traditions to younger members. American Indians living on reservations are often both geographically isolated and sovereign while still relying on the federal government (Herman-Stahl, Spencer, and Duncan 2003).

In addition to this atypical assimilation process, Native Americans often struggle with ethnic identity. One's racial identity does not necessarily align with blood quantum, which is commonly a criterion for tribal enrollment. Gone (2006) contends that using blood quantum stems from "colonial relations in which the U.S. government effectively enforced its vested interest in defining Indians for the purpose of controlling Native people, lands, and resources" (60). Frequently an indigenous person must be at least ¼ blood quantum "Indian-blooded" to be tribally enrolled to receive tribal benefits.

In a literature review of the role of ethnic identity as a protective factor among ethnic minority adolescents who were adopted and cared for in England, Castle et al. (2011) provide an overview of a conceptualization of ethnic identity formation. This model includes 1) pre-encounter, in which the individual uses the White majority as a reference, 2) encounter, in which a person is awakened to being the minority by a significant event and experiencing prejudice, 3) immersion-emersion, in which the individual embraces themselves in their minority culture, and finally 4) internalization, a process marked by gaining a balanced perspective.

While scholars often hypothesize a link between racial identity and various health outcomes, few studies have been able to produce a significant association. Beauvais (1998b) suggests that an established link between ethnic or cultural identification and substance use remains "elusive." Broad ethnic categories contribute to this problem. He determines that "despite the paucity of findings, most investigators are unwilling to concede that a higher level of identification with culture is not, in some way, 'protective' against substance use," instead concluding that these effects are subtle and often influenced by other factors (1331). Researchers may be hesitant to accept the lack of a significant relationship between

ethnicity and cultural identification for American Indians due to their history of oppression (Cheadle and Whitbeck 2011; Frank et al. 2000; Prussing 2007; Collins and McNair 2002).

Grouping together all American Indian tribes is also problematic (Gomberg 2003) due to the heterogeneity of tribes, but is often necessary for quantitative analysis. Among Northern Plains Indians, the odds of young adult migration away from the reservation increased with desired educational attainment and perceived importance of maintaining tribal traditions, while the odds decreased with greater alcohol consumption (Croy et al. 2009). Not all cultural identification studies have found a neutral or positive effect on health. Recent studies (Angstman et al. 2009) have found links between American Indian cultural identification and recreational smoking. Cultural identity may also mediate the relationship between discrimination and health, substance use, and mental health (Tann et al. 2007).

Social Support and Social Network Ties

The quality and quantity of a social support network may help alleviate some of the stress from ACEs, household dysfunction, and discrimination. Bird (1999) defines social support as "the sense of being valued as a person, being cared for and loved, and of having someone who will listen, understand, and help when needed" (34). According to Erickson (2003), those with someone they feel they can count on "feel less depressed, get less physically ill and live longer than those who do not" (28). In relation to alcohol use, social networks could have a variety of outcomes. A supportive network may help an individual abstain from alcohol, or provide more opportunities for consumption.

Lack of close ties from religious group members is linked to increased risk of alcohol abuse and dependence (Chou, Liang, and MacKenzie 2011). Thoits (2011) suggests that visible

and deliberate social support contributes to the stress-buffering process. She further posits that in instances where the stressor is perceived as under the individual's control, support will be given less spontaneously and generously. Social support is also part of how Northern Plain American Indians with a history of alcohol dependence report maintaining abstinence (Bezdek and Spicer 2006).

The modified trauma model for American Indians and accompanying literature review guide the rest of the dissertation. The next chapter will provide an analytical framework. It will describe the purpose and characteristics of the NESARC, as well as describe the methods used in the analytical chapters to follow.

CHAPTER 3: ANALYTICAL FRAMEWORK

In this chapter I will describe the data and methods utilized in this dissertation. Although each chapter relies on a different statistical technique, each chapter uses the same base set of sociodemographic, risk, and protective factors. These measures will be described in detail in Chapter 4.

Data

Few nationally representative surveys provide a large enough sample to investigate Native American alcohol outcomes relative to other racial/ethnic groups. The National Epidemiologic Survey of Alcohol and Related Conditions (NESARC) allows for such analyses. The NESARC was conducted by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) with additional support from the National Institute on Drug Abuse (NIDA). Some of the main purposes of this survey are to "determine the prevalence, incidence stability, and recurrence of AUDs and their associated disabilities in the general U.S. population", as well as within population subgroups, and "factors identified with the natural history of AUDs" (NIAAA 2013). These data also provide insight into a variety of psychological health issues.

For the first wave in 2001-2002, citizens and noncitizens who were non-institutionalized adults aged 18 or older from all 50 states, the District of Columbia, residents in non-institutionalized quarters such as dormitories, boarding houses, and shelters, and military personnel living off base were sampled. From August 2004 to September 2005, 34,653 respondents were re-interviewed. The attrition of 8,400 respondents was due to ineligibility due to institutionalization, becoming mentally or physically impaired, or on active military duty

during the follow-up, deceased, or deported (N=3,134). An additional 5,306 respondents were eligible but refused or could not be located.

For Wave 1, the response rate of households was 89%, while the person response rate 93%, for an overall response rate of 81%. Combined with the 86.7% response rate of Wave 2, the overall response rate was 70.2%. Sampling weights are provided in Wave 2 data. To encourage participation in Wave 2, each respondent was mailed a $40 debit card unconditionally, with an additional $40 debit card provided to respondents upon completion. In Wave 1 there are 701 Native American respondents. In Wave 2, this number drops to 580, though one of these cases is misclassified as Black, non-Hispanic, and another case is misclassified as Hispanic, for a Wave 2 N of 578. The retention rate for Native Americans is 82.74%, which is the highest of all racial/ethnic groups, and significantly higher than all racial/ethnic groups except for Whites.

The multi-staged stratified design of the NESARC relied on primary sampling units (PSUs) to capture particular sociodemographic criteria. The first 655 PSUs were selected from the Census 2000/2001 Supplementary Survey and Census 2000 Group Quarters Inventory with certainty due to their population of 250,000 or greater in 1996, while the remaining PSUs stratified by sociodemographic characteristics within each state. In each household, one person was randomly selected, with an oversampling of respondents aged 18 to 25 at a rate of 2.25 times other household members. Non-Hispanic Blacks were also oversampled increasing the sample from about 12.3% to 19.1% and Hispanic households from 12.5% to 19.3%. Face-to-face interviews were completed through computer-assisted personal interviews (CAPI) by trained staff.

Methods

Although the NESARC has two waves of data, the majority of my variables of interest are present only in Wave 2. Therefore, only data from Wave 2 will be used in these analyses. Weights have been assigned to descriptive analyses and more sophisticated analysis to account for the survey design when American Indians are compared to other racial/ethnic groups for illustrative purposes. Native Americans are the main focus of this dissertation, though they may be compared to other groups. Each chapter (Chapters 4 through 7) addresses a different outcome requiring a different analytical approach.

First, I will use descriptive statistics to highlight the differences between Native Americans and other racial/ethnic groups in terms of the prevalence of stressors, coping mechanisms, and alcohol use outcomes in Chapter 4. Next, I will begin to examine how this conceptual model of stressors and coping mechanisms influences the decision to drink using only Native Americans in Chapter 5. For this, I will use a multinomial logistic regression model to predict if individuals are lifetime abstainers, former drinkers, or current drinkers. Then, in Chapter 6, I will examine beverage preference and consumption choices among current drinkers. Although this sample is comprised entirely of American Indians who drank at least some alcohol in the past twelve months, there will be individuals who have not had a particular type of beverage. For this analysis, I will use another multinomial logistic regression model to determine the alcoholic beverage of choice based on frequency of consumption. The next portion of this chapter will be to use a negative binomial model to predict actual counts of average consumption of that beverage. Finally, Chapter 7 uses a logistic regression model to test my general conceptual model on binge drinking.

For each chapter I will also test the buffering effects of coping mechanisms as outlined in the conceptual model. To accomplish this, I perform a stratified analysis, separating groups of low and high levels of social support, and low and high levels of social preference for same race peers. I will then examine the differences between groups on key stressors ACEs and discrimination.

CHAPTER 4: MEASURES AND DESCRIPTIVE STATISTICS

Before beginning any analysis on Native Americans, this chapter describes the key independent or predictor variables and outcomes to demonstrate how different or similar Native Americans are to other racial/ethnic groups. These variables are grouped by sociodemographic factors, stressors, coping mechanisms, and alcohol use outcomes. Native Americans are the reference group for each variable, so the tables represent significant differences from other groups only to Native Americans and not to each other. Throughout the following analytical chapters, the same base sets of variables are used. These variables are described here as a reference, though some variables unique to a chapter will be described in the appropriate place.

Methods

In order to show statistical differences between Native Americans and other racial/ethnic groups, I have performed tabulations and various regression techniques. For dichotomous variables, I report the number of respondents (N) and percentage (%) of each racial/ethnic group that answered "yes" for each variable. I then conducted a simple logistic regression for each variable with only the outcome variable regressed on the race/ethnicity, with the reference group set as Native American. For continuous variables, I report the mean and significance obtained from regression analyses. Counts for beer, wine, coolers, and liquor are reported by mean and significance from a negative binomial regression. When necessary, I created dummy variables for non-dichotomous variables and tested each dummy variable separately (e.g., region and community). These strategies allow for the greatest parsimony in the table, showing both the percentage within groups and the any statistical significant deviations from Native Americans between groups. Tests of statistical significance treat indigenous people as the reference.

Measures

This section serves as the most detailed account of variables used throughout this dissertation. These measures are divided into sociodemographic variables, stressors, coping mechanisms, and alcohol use outcomes. For scales I created, I provide information on whether the measures successfully load on to one factor as an indicator of whether or not the measures belong together. I also report a reliability statistic, Cronbach's alpha for each scale.

Sociodemographic Variables

Race/ethnicity is established through an algorithm also used by the Census Bureau. Respondents were asked to indicate as many racial categories as necessary and whether or not they were of Hispanic origin. When a respondent selected multiple categories, they were assigned to only one group in the following order of preference: 1) Black or African American, 2) American Indian and Alaska Native, 3) Native Hawaiian and Other Pacific Islander, 4) Asian, and 5) White, resulting in the created race/ethnicity variables 1) White, non-Hispanic, 2) Black, non-Hispanic, 3) American Indian/Alaska Native, non-Hispanic, 4) Asian/Native Hawaiian/Other Pacific Islander, non-Hispanic, and 5) Hispanic, any race. Given the forced structure of the ethnicity question and lack of tribal affiliation or blood quantum the category of American Indian/Alaska Native could encompass a very heterogeneous group. This could particularly come into play when I consider culture and strength of racial identity as protective factors from alcohol use and misuse. There is no way to determine whether or not an individual lives on or off a reservation.

Male is coded as 1, while females are coded as a 0. I chose this coding scheme with the knowledge that men are more likely than women to use and misuse alcohol. The variable

coupled (0=no, 1=yes) refers to respondents married or cohabiting with a spouse-like partner. The presence of children in the home is also dichotomous (0=no, 1=yes) rather than using the actual number of children under the age of 18 living in the respondent's home. This measure is determined by combining several questions in the NESARC regarding the age of children in the home. Age is a continuous variable, which is also represented with age categories. These age categories are 20 through 30, 31 to 45, 46 to 60, and over 61. Health insurance coverage is coded as 0=no coverage, 1= Medicare or Medicaid, and 2=private insurance. Employment status is measured by the employed variable (0=no, 1=yes), which refers a respondent's present situation and considers both part-time work and full-time work as being employed.

Respondents were asked to report their total household income in the past year (including income from food stamps) using 21 response categories. I took the midpoint of these categories to construct a continuous variable. I created a categorical version of income by dividing respondents into three groups roughly similar in size, with the lowest category representing incomes from $0 to $22,500, middle income from $27,500 to $55,000, and high income from $55,001 to $321,522. Education is coded into four groups: less than high school; high school degree (or Graduate Equivalency Degree); some college (including only an associate's degree or technical 2-year degree); and, college degree. Region is divided into categories Northeast, Midwest, South, and West. Community is divided into three categories (1=In MSA- central city, 2= in MSA- not central city, and 3=not in MSA). I refer to these categories as urban, suburban, and rural, respectively. Descriptive statistics for these measures are shown in Table 4.1 below.

Table 4.1 Sociodemographic Differences between Native Americans and other Racial/Ethnic Groups

	Native American	White	Black	Asian	Hispanic	Total
	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)
Male	343	11,827	1,673	723†	2,040***	16,606
	(45.17%)	(48.13%)	(43.70%)	(48.48%)	(50.85%)	(47.92%)
Mean Age	48.47	49.90*	45.42***	44.53***	41.38***	48.16
	(16.19)	(17.51)	(16.32)	(15.95)	(15.06)	(17.28%)
20-30	102	3,889†	827***	331***	1,124***	6,273
	(13.50%)	(15.82%)	(21.61%)	(22.36%)	(28.01%)	(18.10%)
31-45	252	6,859***	1,262	501	1,554***	10,428
	(33.25%)	(27.91%)	(32.96%)	(33.82%)	(38.73%)	(30.09%)
46-60	233	7,048	1,014*	386*	840***	9,521
	(30.73%)	(28.68%)	(26.49%)	(26.07%)	(20.94%)	(27.48%)
61+	171	6,777***	725*	263**	494***	8,430
	(22.51%)	(27.58%)	(18.94%)	(17.75%)	(12.31%)	(24.33%)
Coupled	470	16,343**	1,640***	1,036***	2,615†	22,105
	(61.94%)	(66.51%)	(42.48%)	(69.98%)	(65.20%)	(63.79%)
Children Present in the Home	249	7,270†	1,290	571**	1,865***	11,244
	(32.75%)	(29.59%)	(33.68%)	(38.53%)	(46.50%)	(32.45%)
Less than HS	147	2,456***	669	167***	1,380***	4,818
	(19.35%)	(9.99%)	(17.47%)	(11.27%)	(34.41%)	(13.90%)
HS Degree	215	6,921	1,153	243***	984*	9,516
	(28.32%)	(28.16%)	(30.12%)	(16.44%)	(24.52%)	(27.46%)
Some College	266	7,893†	1,310	344***	1,091***	10,904
	(35.02%)	(32.12%)	(34.21%)	(23.24%)	(27.20%)	(31.47%)
College Degree	131	7,303***	344	726***	557*	9,415
	(17.31%)	(29.72%)	(23.24%)	(49.05%)	(13.87%)	(27.17%)
Paid work in PY	464	15,479	2,447	971	2,809***	22,170
	(61.11%)	(62.99%)	(63.92%)	(65.54%)	(70.02%)	(63.98%)
No Health Insurance Coverage	119	2,236***	650	231	1,128***	4,364
	(15.66%)	(9.10%)	(16.98%)	(15.60%)	(28.12%)	(12.59%)
Medicare or Medicaid	102	2,146***	686**	150*	562	3,646
	(13.48%)	(8.73%)	(17.92%)	(10.10%)	(14.00%)	(10.52%)
Private Health Insurance	538	20,191***	2,492**	1,100†	2,322***	26,643
	(70.86%)	(82.17%)	(65.10%)	(74.30%)	(57.88%)	(76.89%)
Mean Household Income	49,111	66,217***	43,822*	72,891***	47,668	61,506
	(47,623)	(60,358)	(41,515)	(65,365)	(42,910)	(57,448)

Low	274	5,402***	1,503	293***	1,257*	8,729
($2,500-22,500)	(36.06%)	(21.98%)	(39.25%)	(19.79%)	(31.33%)	(25.19%)
Middle	270	8,924	1,409	497	1,727***	12,826
($27,500-55,000)	(35.55%)	(36.32%)	(36.80%)	(33.56%)	(43.04%)	(37.01%)
High	215	10,247***	917*	691***	1,028	13,098
($55,001-321,522)	(28.39%)	(41.70%)	(23.96%)	(46.65%)	(25.63%)	(37.80%)
Northeast Region	152	4,517	717	232*	541***	6,160
	(19.97%)	(18.38%)	(18.74%)	(15.67%)	(13.50%)	(17.78%)
Midwest Region	134	4,332	684	328*	926***	6,404
	(17.62%)	(17.63%)	(17.85%)	(22.17%)	(23.08%)	(18.48%)
South Region	301	9,510	1,471	557	1,483	13,322
	(39.64%)	(38.70%)	(38.43%)	(37.61%)	(36.97%)	(38.44%)
West Region	173	6,213	956	364	1,061*	8,767
	(22.78%)	(25.28%)	(24.98%)	(24.56%)	(26.45%)	(25.30%)
Urban Community	278	7,903	1,354	477	1,330	11,342
	(36.67%)	(32.16%)	(35.37%)	(32.20%)	(33.16%)	(32.83%)
Suburban	373	12,649	1,853	745	1,040	17,660
Community	(49.14%)	(51.48%)	(48.40%)	(50.29%)	(50.86%)	(50.96%)
Rural Community	108	4,021	621	259	641	5,651
	(14.19%)	(16.36%)	(16.23%)	(17.51%)	(15.99%)	(16.31%)

Source: Wave 2 NESARC

Notes: Significance compared to Native Americans, p<.10†, p<.05*, p<.01**, and p<.001***. Weighted data.

In terms of demographic variables, Native Americans in this sample do not consistently stand out as unique compared to other racial/ethnic groups. As shown in Table 4.1, this sample of Native Americans is older than Blacks, Asians, and Hispanics. They are less likely than Whites and Asians to be cohabiting with a partner or married, but more likely than Blacks. Native Americans are less likely to have a college degree than Whites and Asians, but more likely than Hispanics. In terms of health insurance coverage, indigenous people are more likely than Whites or Asians to have Medicare or Medicaid, but less likely than Blacks. The largest proportion of Native Americans is in the South, and almost half of these individuals live in suburban areas, with the smallest percentage living in rural areas. Despite minor differences

between groups, Native Americans do not appear to be starkly different from other racial/ethnic groups in demographics and socioeconomic status.

Stressors

Although the variables included in measures of ACEs and household dysfunction vary somewhat by researcher, data set, or study, I will use the same definitions as Ruan et al. (2008). These variables were tested and retested for reliability using the NESARC, the data set for this dissertation.

Adverse Childhood Experiences include physical neglect, physical abuse, verbal abuse, and witnessing aggression toward one's mother before the age of 18. These measures were adapted from the Adverse Childhood Events study (Dube et al. 2003; Dong et al. 2003). These measures are transformed into dichotomous variables (0=no/never, 1=yes/ever) from the original scale (1=never to 5=very often). Next, individual components are summed to create one dichotomous measure for any type of that type of adverse experience. Physical neglect is based on 5 measures involving how often a respondent reported the following scenario before the age of 18: 1) given chores by a parent/caregiver that were too difficult or dangerous for that age, 2) left alone or unsupervised before the age of ten, 3) needs not met because a parent/caregiver spent the money on themselves, 4) gone hungry or not have regular meals, or 5) ignored by a parent/caregiver when they needed treatment for being sick. Abuse is divided into verbal abuse and physical abuse. Verbal abuse is based on how often the respondent reports that a 1) parent/caregiver swore, insulted, or said hurtful things to them, 2) threatened to hit them or throw something at the them, 3) or fear that they would by physically hurt or injured by parent/caregiver. Physical abuse is based on how often a parent/caregiver 1) pushed, grabbed, shoved, slapped or hit them and 2) hit them hard enough to leave marks, bruises, or injury. The

last measure is witnessing aggression toward one's mother by a father or other adult male. Respondents were asked how often they witnessed their father or another adult male 1) hit their mother with a fist or something hard, 2) repeatedly hit their mother for a least a few minutes, or 3) threaten their mother with a knife or gun or use a knife or gun to hurt her. These components are summed for a scale of ACEs ranging from zero to five, with a five indicating that the respondent had experienced each type of ACE. The alpha scores reported by Ruan et al. (2008) are 0.78 for physical abuse, 0.90 for sexual abuse, 0.85 for verbal abuse (or emotional abuse), 0.85 for physical abuse, and 0.86 for battered mother or caregiver. In a factor analysis, all variables can be loaded on to one factor with a Cronbach's alpha of 0.71.

Another aspect of disadvantage stemming from childhood involves measures of global household dysfunction. Ruan et al. (2008) refer to these measures as "other childhood adverse events" with an alpha of 0.72. These measures are dichotomous and refer to the situation of their childhood home. Aspects of household dysfunction are having a parent or other adult in the home who had 1) problems with alcohol, 2) problems with drugs, 3) went to jail or prison, 4) treated or hospitalized for a mental illness, 5) attempted suicide, or 6) committed suicide. The measure of having a parent or other adult in the home with an alcohol problem is separate from a question asking specifically about biological parent's alcohol problems, though the correlation between these measures is 0.53. These six variables of household dysfunction can load on one factor with a Cronbach's alpha of 0.78. Although receiving welfare before the age of eighteen is also included this section, it is not part of the household dysfunction score. This measure did not load onto the same factor as the other measures of dysfunction and was asked separately in the survey. Nonetheless, receiving welfare may be an important indicator of disadvantage. The number of years spent on welfare is also available.

The final stressor is perceived racial discrimination. The original measure of perceived discrimination was on a five-point scale (1=Never to 5=Very Often) that indicates the amount of discrimination related to their race/ethnicity that respondents perceived occurring in the last year in various aspects of life including: 1) ability to obtain healthcare or insurance coverage, 2) how treated when received healthcare, 3) in public places such as streets, stores, and restaurants, 4) other situations such as finding a job, being harassed by the police, obtaining housing, and, gaining admittance to school or trade, 5) called a racist name, and 6) made fun of, picked on, pushed, shoved, hit or threatened with harm. This scale was modeled from the Experiences with Discrimination (EOD) scales and Ruan et al. (2008) reports an alpha of 0.74. Since 80% of respondents reported perceiving no racial discrimination, a dichotomous scale was created for each type of discrimination. After recoding to a dichotomous variable (no=0, yes=1), high values on the discrimination scale, which ranges from zero to six, indicate that a respondent perceived more discrimination. Due to small cell sizes, this variable was again dichotomized into whether or not a respondent had experienced any racial discrimination in the past year. Questions were asked separately to Hispanics and non-Hispanics, so these measures were coded into a new combined variable. These measures can load on to one factor with a Cronbach's alpha of .77. Discrimination has been positively linked to alcohol abuse for African Americans (Martin et al. 2003) and Native Americans (Whitbeck 2004b).

Table 4.2 Differences between Native Americans and other Racial/Ethnic Groups in Stressors

	Native American	White	Black	Asian	Hispanic	Total
	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)
Adverse Childhood Experiences	1.72 (1.66)	1.27*** (1.42)	1.40*** (1.5)	1.08*** (1.36)	1.31*** (1.48)	1.29 (1.44)
Physical Neglect	295 (38.82%)	7,173*** (29.29%)	1,151*** (30.06%)	492** (33.19%)	1,460 (36.39%)	10,570 (30.50%)
Physical Abuse	321 (42.24%)	8,665*** (35.26%)	1,406** (36.72%)	389*** (26.24%)	1,303*** (32.49%)	12,083 (34.87%)
Verbal Abuse	365 (48.16%)	9,522*** (38.75%)	1,593*** (41.60%)	461*** (31.16%)	1,419*** (35.38%)	13,360 (38.56%)
Sexual Abuse	135 (17.76%)	2,460*** (10.01%)	470*** (12.27%)	73*** (4.93%)	397*** (9.89%)	3,534 (10.20%)
Witnessed Marital Aggression	188 (24.79%)	3,399*** (13.83%)	725*** (18.94%)	190*** (12.85%)	686*** (17.09%)	5,188 (14.97%)
Dysfunction in Childhood Home	0.64 (1.02)	0.46*** (1.01)	0.43*** (0.92)	0.25*** (0.89)	0.43*** (0.92)	0.45 (0.99)
Parent w/Alcohol Problem	238 (31.87%)	5,603*** (22.94%)	777*** (20.49%)	114*** (7.80%)	870*** (21.82%)	7,602 (22.09%)
Parent w/ Drug Problem	51 (6.80%)	1,120** (4.58%)	213 (5.63%)	54** (3.72%)	201* (5.04%)	1,639 (4.76%)
Parent in Jail	77 (10.24%)	1,573*** (6.44%)	359 (9.46%)	66**** (4.54%)	337 (8.45%)	2,411 (7.01%)
Parent Mental Problem	48 (6.34%)	1,443 (5.91%)	171* (4.52%)	53** (3.62%)	157** (3.93%)	1,871 (5.44%)
Parent Suicide Attempt	45 (6.05%)	979** (4.01%)	88*** (2.32%)	45*** (3.06%)	127*** (3.20%)	1,284 (3.74%)
Parent Committed Suicide	16 (2.12%)	541 (2.21%)	55 (1.44%)	30 (2.07%)	51† (1.28%)	692 (2.01%)
Ever Received Welfare	155 (20.75%)	2,613*** (10.73%)	1,024*** (27.11%)	95*** (6.48%)	645** (16.20%)	4,533 (13.20%)
Average Years on Welfare	5.97 (5.28)	5.09* (4.57)	8.01*** (5.61)	5.18 (4.61)	6.49 (5.33)	5.97 (5.10)
Alcoholic Bio. Mother	88 (11.99%)	1,525*** (6.34%)	214*** (5.74%)	19*** (1.29%)	137*** (3.51%)	1,983 (5.86%)
Alcoholic Bio. Father	224 (31.47%)	4,826*** (20.49%)	682*** (19.55%)	90*** (6.33%)	798*** (21.01%)	6,621 (20.07%)
Perceived Racial Discrimination	0.194 (0.396)	0.102*** (0.303)	0.395*** (0.489)	0.317*** (0.466)	0.251*** (0.433)	0.163 (0.369)

Source: Wave 2 NESARC

Notes: Significance compared to Native Americans, p<.10†, p<.05*, p<.01**, and p<.001***. Weighted data.

Significant differences begin to emerge in Table 4.2 as other groups are compared to Native Americans in terms of stressors. They are significantly more likely than the other racial/ethnic groups to experience each component of ACEs, as well as a higher mean on the cumulative score of ACEs. Although they also score higher on overall measures of household dysfunction, Blacks are more likely to report receiving welfare during their childhood, and more average years on welfare than Native Americans. There are no significant differences between these groups in terms of having a parent with a drug problem or having a parent in jail. Native Americans are significantly more likely than other racial/ethnic groups to have a parent or adult in the household with an alcohol problem or to have a parent attempt suicide. Native Americans report significantly more discrimination than Whites, but significantly less than minority other groups.

Coping Mechanisms

The two main components of coping mechanisms are enculturation and social support. Level of enculturation is measured with three indicators: Language preference for using non-English languages; social preference for same- or intra-ethnic social ties and interactions; and, racial identity. Based on the same reasoning as the "healthy immigrant effect," racial minorities who are more enculturated rather than assimilated may suffer fewer alcohol misuse issues. For all of these measures, higher values reflect greater enculturation. Ruan et al. (2008) reports on the scale reliability of acculturation, which was adopted from Cuellar et al.'s (1995) Acculturation Rating Scale II for Mexican Americans (ARMSA-II). This acculturation scale

includes language preference and social preference with a Cronbach's alpha of 0.85 (Ruan et al. 2008).

The measures are based on comparable questions asked of respondents from multiple racial/ethnic groups, though the language preference questions were not asked of respondents that speak only English. The language preference measure is based on seven questions regarding which language a respondent uses in five different situations (e.g., reading, speaking, speaking with a child, when thinking, or listening to the radio). Possible responses were: 1) only native language, 2) more native language than English, 3) both languages equally, 4) more English than native language, 5) and only English. After reverse coding and summing across the questions, the final language preference measure had a range of 7 to 35 with higher values indicating a greater preference for using the native language over English. English-only respondents were given a value of seven on the scale. These variables can load on to one factor with a Cronbach's alpha of 0.96.

The social preference measure is based on respondents' expressed racial/ethnic preference for 1) close friends, 2) people at the social gatherings and parties they prefer to attend, 3) people they visit with, and 4) their children's friends if they could choose. Possible responses are: All from my racial/ethnic group; more from my racial/ethnic group than other groups; about half and half; more from other groups; and, all from other groups. I reverse coded and summed the responses to construct a summary measure of social preference (range of 4 to 20) with higher values indicating a greater preference for one's own group. All of these variables can load on to one factor with a Cronbach's alpha of 0.74.

The strength of racial identity is based on six questions on racial/ethnic orientation. Ruan et al. (2008) report the alpha for this scale as 0.79. Respondents were asked how strongly they

agree or disagree (five-point scale) that: 1) they have a strong sense of self as a member of their racial/ethnic group, 2) they identify with other people from their racial/ethnic group, 3) most of their close friends are from their racial/ethnic group, 4) racial/ethnic heritage is important in their life, 5) their racial/ethnic background plays a big part in how they interact with others, and 6) their values, attitudes and behaviors are shared by most members of their racial/ethnic group. After reverse coding as needed and summing the responses, the racial identity measure had a range of 8 to 48 with higher values indicating a stronger identification with one's racial or ethnic group. Each of these measures loads on to one factor with a Cronbach's alpha of 0.86. The correlation between language preference and social preference is 0.01, between language preference and ethnic identity is 0.19, and between ethnic identification and social preference is 0.29.

Level of social support is based on two sets of questions. These sets of questions were originally from the Interpersonal Support Evaluation List (ESEL12) (Ruan et al. 2008). One set is positively worded, indicating higher levels of social support (1=definitely false to 4=definitely true). These measures include 1) knowing someone would help during illness, 2) someone to turn to for handling problems in the family, 3) easy to find someone to see a movie with the same day, 4) someone to turn to for suggestions on how to deal with a personal problem, 5) easy to find someone to go to lunch with, and 6) someone would to help if stranded ten miles from home. The other set is negatively worded indicating lower degrees of social support. This set includes how true the respondent feels about scenarios including: 1) hard time finding someone to go on a day trip with me, 2) no one with whom to share most private worries and concerns, 3) don't get invited to do things with others, 4) difficult to find someone to look after house or apartment while out of town for a few weeks, 5) difficult to find someone to give me good

advice about family crisis and how to handle it, and 6) hard time finding someone to help me move into a new house or apartment. These negatively worded questions are recoded to reflect higher values as more social support. These items are summed for a measure of total social support. These variables load on to one factor with a Cronbach's alpha of 0.83.

A respondent's social network is based on close ties and instrumental ties. The number of close ties is based on how many 1) grown children, 2) parents or guardians, 3) spouse's parents or guardians, 4) other relatives, and 5) close friends the respondent sees or talks to on the phone or internet at least once every two weeks. Instrumental ties include 1) fellow students or teachers, 2) coworkers, 3) neighbors, 4) fellow community service volunteers, and 5) members from other groups that the respondent sees socially or visits at least once every two weeks. The original maximum number reported for these ties are 175 and 234, respectively. Each of these variables was top coded at a standard deviation above the mean. If a respondent does not belong to a particular category they are given a zero for that measure rather than remove them from the analysis. Total social network size is a summed measure of close ties and instrumental ties.

Table 4.3 below demonstrates that Native Americans in this sample do not stand out as having a strong preference for a native language other than English, preference for same-raced peers, or a strong sense of racial identity compared to other groups. This does not mean, however, that these issues are not salient within the community in the analysis of alcohol outcomes. Native Americans have significantly more close ties than members of other racial/ethnic groups.

Table 4.3 Differences between Native Americans and other Racial/Ethnic Groups in Coping Mechanisms

	Native American	White	Black	Asian	Hispanic	Total
	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)
Language Preferences	7.98 (3.42)	7.49*** (2.58)	7.61* (2.82)	16.90*** (7.45)	19.19*** (9.12)	9.26 (5.85)
Social Preferences	11.62 (3.43)	12.07*** (3.46)	11.90† (2.91)	10.57*** (3.63)	11.81 (4.01)	11.94 (3.49)
Strength of Racial Identity	36.39 (6.74)	36.50 (6.46)	39.44*** (5.64)	37.46*** (7.01)	39.27*** (7.67)	37.19 (6.67)
Social Support	42.12 (5.73)	42.77*** (5.28)	42.24 (5.75)	41.80 (5.59)	41.70† (5.91)	42.53 (5.45)
Number of Close Ties	10.02 (6.97)	9.76 (6.30)	9.69 (6.56)	9.10*** (6.51)	9.41* (6.24)	9.69 (6.35)
Number of Instrumental Ties	5.94 (6.29)	6.85*** (6.94)	5.73 (6.37)	5.55 (6.25)	4.95*** (5.83)	6.43 (6.75)
Social Network Size	15.24 (9.15)	15.85 (9.11)	14.89 (9.02)	14.32* (9.17)	14.03*** (8.59)	15.46 (9.07)

Source: Wave 2 NESARC

Notes: Significance compared to Native Americans, p<.10†, p<.05*, p<.01**, and p<.001***. Weighted data.

Alcohol Outcomes

Each analytical chapter (Chapters 5, 6 and 7) focuses on a different aspect of alcohol use or misuse. Respondents were asked about their drinking status since the last interview. The NESARC calculates a lifetime drinking status by incorporating data from Wave 1. The final categories are 1) lifetime abstainers, 2) former drinkers who have not consumed alcohol in the past twelve months, but have consumed alcohol in their lifetimes, and 3) current drinkers who drank at least one drink in the last twelve months.

Although an individual may enjoy the taste of a certain beverage over others, or gravitate toward a particular beverage based on cost or availability, these measures are not available in the NESARC. Instead, I base beverage preference on the highest frequency of consumption. Respondents were asked how often they drink particular types of alcoholic beverage. The responses range from every day to never. The most preferred beverages will be modeled based on self-reports of how often a respondent usually drinks that particular beverage ranging from every day to not drinking that beverage in the past year. A respondent drinking two or more beverages with equal frequency are labeled as having no preference. For specific beverage counts, I will model both the number of drinks usually consumed on days that beverage was consumed in the past year, as well as the most consumed in a day. Only current drinkers provide valid responses to these questions, and a zero is a valid response if the respondent reports drinking in the past twelve months but did not drink a particular beverage. Examples of each type of alcoholic beverage are provided in Chapter 6.

The final outcome is a measure of alcohol misuse. Binge drinking is defined as men drinking more than five drinks at a time, and four for women, in the past twelve months (no=0, yes=1). There are different thresholds for women and men due to differences in size and blood alcohol concentration.

As shown in Table 4.4, the majority of Native Americans and all other racial/ethnic groups are current drinkers. No aspect of American Indian's drinking status is remarkable compared to these other groups. More differences, however, emerge among current drinkers.

Table 4.4 Alcohol Outcome Differences between Native Americans and other Racial/Ethnic Groups

	Native American	White	Black	Asian	Hispanic	Total
	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)
Drinking Status						
Lifetime Abstainer	111	2,379***	694*	448***	715*	4,347
	(14.68%)	(9.68%)	(18.12%)	(30.25%)	(17.83%)	(12.55%)
Former Drinker	191	4,998***	1,034	294**	857*	7,373
	(25.25%)	(20.34%)	(27.00%)	(19.83%)	(21.36%)	(21.28%)
Current Drinker	457	17,196***	2,101**	739***	2,439	22,932
	(60.17%)	(69.98%)	(54.88%)	(49.92%)	(60.81%)	(66.18%)
Preference						
No Preference	80	2,796	399	151	406	3,831
	(17.58%)	(16.26%)	(18.98%)	(20.36%)	(16.63%)	(16.71%)
Beer	196	6,952	797*	310	1,299***	9,553
	(42.88%)	(40.43%)	(37.92%)	(41.94%)	(53.24%)	(41.66%)
Coolers	27	880	199*	37	142	1,284
	(5.92%)	(5.12%)	(9.45%)	(4.95%)	(5.82%)	(5.60%)
Wine	74	4,239***	330	193***	314†	5,151
	(16.24%)	(24.65%)	(15.70%)	(26.16%)	(12.88%)	(22.46%)
Liquor	79	2,330*	377	49***	278***	3,113
	(17.38%)	(13.55%)	(17.95%)	(6.60%)	(11.41%)	(13.58%)
Consumption						
Beer usually	2.17	1.68***	1.51***	1.39***	2.38†	1.74
consumed	(3.25)	(2.13)	(1.94)	(1.65)	(2.86)	(2.23)
Beer most	4.22	3.32***	2.45***	2.69***	4.01	3.31
consumed	(6.28)	(4.51)	(3.63)	(3.78)	(5.09)	(4.54)
Wine usually	0.67	0.93***	0.70	0.88***	0.63	0.87
consumed	(0.94)	(0.96)	(1.07)	(0.86)	(0.98)	(0.97)
Wine most	0.97	1.40***	0.96	1.30***	0.88	1.29
consumed	(1.43)	(1.65)	(2.27)	(1.49)	(1.42)	(1.69)
Coolers usually	0.43	0.41	0.48	0.30**	0.40	0.42
consumed	(0.93)	(0.88)	(0.89)	(0.65)	(0.92)	(0.88)
Coolers most	0.63	0.57	0.61	0.40**	0.53	0.57
consumed	(1.43)	(1.30)	(1.22)	(0.91)	(1.33)	(1.29)
Liquor usually	1.26	1.10*	1.17	0.85***	1.01***	1.09
consumed	(1.63)	(1.46)	(1.36)	(1.24)	(1.52)	(1.46)
Liquor most	2.01	1.76*	1.72*	1.40***	1.49***	1.72
consumed	(3.30)	(2.57)	(2.38)	(2.31)	(2.50)	(2.56)
Alcohol Misuse						
Binge Drank in	203	7,076	725***	213***	1,167	9.348
PY	(44.55%)	(41.22%)	(34.56%)	(28.93%)	(47.89%)	(40.99%)

Source: Wave 2 NESARC

Notes: Significance compared to Native Americans, p<.10†, p<.05*, p<.01**, and p<.001***. Weighted data. Alcohol use and misuse consider only current drinkers.

Among current drinkers, the most preferred alcoholic beverage by all racial/ethnic groups, in terms of frequency of consumption, is beer. American Indians are significantly more likely to prefer beer than Blacks, though less likely than Hispanics. The second most preferred specific beverage among Native American is liquor, which is significantly more than racial/ethnic groups other than Blacks. A sizable portion of individuals report having no clear preference for a specific alcoholic beverage, which indicates drinking two or more alcoholic beverages with the same frequency.

Next, I look for differences for drinking patterns by beverage. Actual consumption of beverages provides insight into drinking behavior. Looking at both the usual number of a particular drink consumed on drinking days and the most consumed in one day. Native Americans usually drink more beer than all groups other than Hispanics, though they surpass even this group in terms of the most beer they have consumed on a given day. Whites and Asians consume more wine than other groups. For coolers, the least consumed beverage by any group, Native Americans consume significantly more than Asians. When looking at usual consumption of liquor, Native Americans and Black are similar to each other while being higher than other racial ethnic groups. However, when comparing the most liquor consumed in a day, Native Americans significantly surpass all groups.

Among current drinkers, the proportion of binge drinkers is significantly higher for American Indians compared to Blacks and Asians. Hispanics actually exceed American Indians

in rates of binge drinking, but do not statistically differ in their rates of binge drinking. These descriptive tables help tell a story that while the proportion of Native Americans who drink is similar to other racial/ethnic groups, their drinking patterns are different and potentially dangerous. In the chapters to come, I will only use Native Americans in the analysis to apply the modified historical loss for American Indians model.

CHAPTER 5: THE DECISION TO DRINK

The previous chapter suggests that Native Americans are not unique in their drinking status. However, applying the modified trauma model here may provide insight into factors influencing drinking decisions. If the stressors proposed in the model significantly increase the risk of being a current drinker compared to lifetime abstainers, this information could be potentially useful in prevention and treatment efforts for this racial group. Similarly, identifying successful coping mechanism could aid in those efforts. The figure below serves as the conceptual model for this analysis and directs the discussion of the literature.

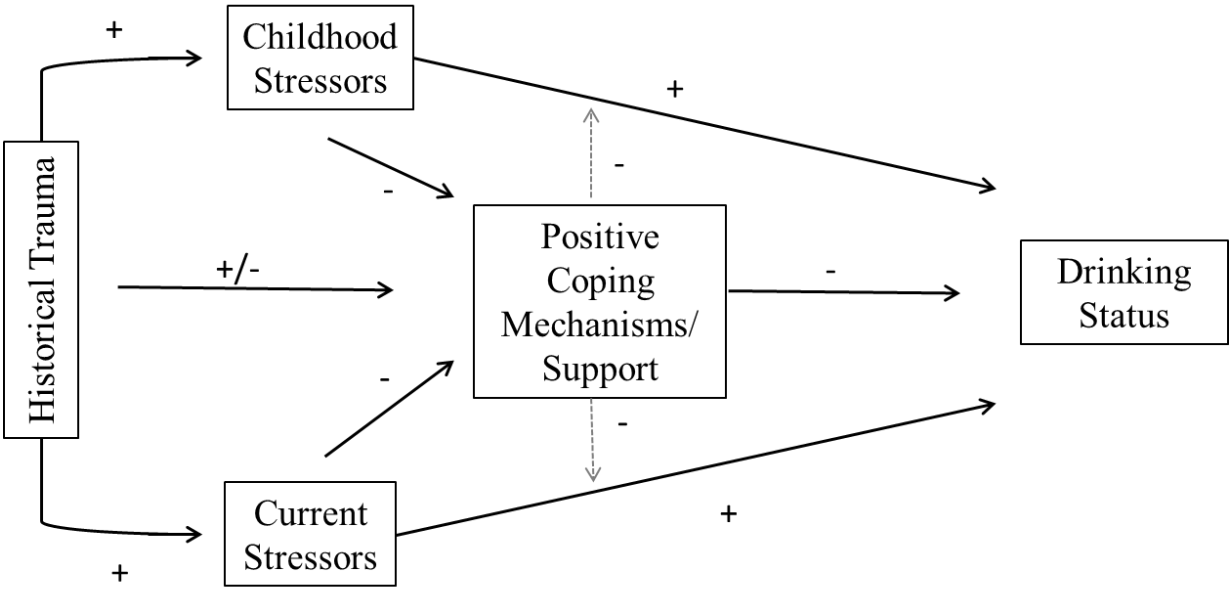

Figure 5.1 Modified Trauma Model for American Indians on Drinking Status

Contemporary Native Americans are still thought to be plagued by historical trauma, the "legacy of colonization and federal assimilation policies" (Whitesell et al. 2012: 379). While there are no direct measures of this concept, I examine adverse childhood experiences, childhood household dysfunction, receiving welfare as a child, having an alcoholic biological parent, and

racial discrimination in the past year given these stressors can be seen as manifestations of the process of historical trauma inflicted on Native Americans. Adverse childhood experiences have been linked to a multitude of negative outcomes for adolescents and adults including alcohol use, substance use and internalizing mood disorders such as anxiety and depression (Rosenberg 2011; Rice et al. 2011; Fetzner 2011; Schilling et al. 2007). Commonly studied adverse childhood experiences include physical neglect, emotional neglect, verbal abuse, physical abuse, sexual abuse, and witnessing aggression toward one's mother. Often, adverse experiences do not occur in isolation and are experienced in combination with other adverse experiences. Felitti et al. report that experiencing four or more categories of adverse childhood experiences "had a 4-to 12-fold increased health risks for alcoholism, drug use, depression and suicide attempt" (1998:245). Similarly, multiple adverse childhood experiences have been linked with both the likelihood of ever drinking and earlier age of first drink in adolescence (Dube et al. 2006).

Aspects of a dysfunctional home as a child may also impact adult drinking decisions. The components of household dysfunction in this analysis are having a parent or guardian in the home with a problem with alcohol, a problem with drugs, a history of incarceration, a mental illness, attempted suicide, or committed suicide. A parent or other adult in the home with a drug or alcohol problem may set an example for children. Dube et al. (2001) find that parents' alcohol misuse is strongly correlated with adverse childhood experiences, suggesting that children of alcoholic parents are at higher risk for experiencing maltreatment. Although parent alcohol abuse may have a genetic component, it may also be indicative of negative childhood experiences.

For adolescents, maltreatment is a robust risk factor for binge drinking, even when parental alcohol abuse is controlled (Shin, Edwards and Hereen 2009). Adolescents who have

experienced maltreatment are also more likely to initiate alcohol use in their preteen years (Hamburger et al. 2008). A study interested in the impact on African American children with incarcerated fathers found that the fathers suffer poor economic outcomes and are less involved with their children (Perry and Bright 2012). Parent incarceration has also been linked to child behavioral problems and depression (Wilbur et al. 2007). Other factors such as households in which a parent suffers from a mental illness, attempts suicide, or commits suicide could also impact a child emotionally and economically.

On the other hand, coping mechanisms may keep Native Americans from drinking. Enculturation, or the practice of one's own culture, may impact drinking tendencies. This concept can be thought of as the opposite of acculturation, in which an individual assimilates into a new host country's culture. Although language preference is frequently used as the main component of acculturation in studies of Hispanics and Asians, very little literature exists on the use of native languages. The 2010 census reports that 30% of American Indians over the age of 5 speak a language other than English at home (U.S. Census Bureau, 2007-2011 American Community Survey). Although different tribes across geographical regions speak different languages, a preference for a native language may be a universal indicator of enculturation.

Another aspect of enculturation is the preference to spend time with members of one's own race. Studies of racial homophily have ranged from social networks through adolescence and adulthood, friendship, and marriage. Evidence of racial homophily in social networks has been found in other minority groups (Wimmer and Lewis 2011; Mollica et al. 2003). Although these studies do not focus on Native Americans, the basic concepts could be applied. These preferences for members of the same race may impact substance use outcomes by either protecting from outside group influences or encouraging behavior.

Although the relationship between American Indians and substance use is frequently theorized, there are no clear patterns (Beauvais 1998b; Cheadle and Whitbeck 2011; Collins and McNair 2002; Frank et al. 2000; Prussing 2007). Diversity between tribes and between mixed-race American Indians may contribute to the lack of consistent findings. It is also possible that American Indians, despite struggling with historical loss, do not have strong connections to their racial identity.

Other protective factors may be a social network ties and the support they provide. Social networks have been included as protective factors against substance abuse among Native American populations (Whitesell et al. 2012), and health in general. Although social support and social networks are theorized here to prevent drinking, in reality, social network ties may increase the opportunities for drinking. Future chapters will address more specific components of alcohol use and misuse, providing for a deeper understanding of the role of social ties and alcohol use.

Data and Methods

There are 578 respondents categorized as Native American in Wave 2 of the NESARC. Using Stata's default list wise deletion techniques, a final N for this analysis is 459. Given the nature of the variables constructed here, there are no problematic outliers or influential cases. Table 5.1 presents descriptive statistics of the variables tested in this chapter. In addition to the N (%) or mean (s.d.), drink status is regressed on each of the predictors to see if the predictive factors distinguish differences between former drinkers and current drinkers to lifetime abstainers. This table also shows potentially problematic small cells.

The statistical technique applied for this chapter is multinomial logistic regression. This type of analysis allows for the modeling of nominal or categorical variables. In this instance, the three outcome possibilities are 1) lifetime abstainer in which the respondent reports never drinking alcohol, 2) former drinker, in which the respondent previously consumed alcohol but not within the past 12 months at the time of Wave 2, and 3) current drinkers, those who report drinking within the past twelve months. The results are presented as a relative risk ratio, which is the exponentiated coefficient. A value greater than one suggests that variable raises the risk of being in the focal category (e.g., former drinker) compared to the reference category/group (here, current drinker). The 95% confidence interval indicates 95% confidence that the "true" population parameter lies between these lower and upper limits. The confidence interval is the z statistic. If the interval contains a zero, then we cannot reject the null hypothesis. The reference group in this analysis is current drinkers, though the relationship between lifetime abstainers and former drinkers is included in the appendix and discussed when relevant here.

As previously discussed in this dissertation, Native Americans are significantly less likely than Whites to be current drinkers, though significantly more than Blacks or Asians. There is no statistical difference in being a current drinker between Native Americans and Hispanics. Native Americans are more likely than all groups except for Blacks to be former drinkers, though the significance between Native Americans and Hispanics is marginal.

I am primarily concerned with how stressors and coping mechanisms as modeled by the modified trauma for American Indians concept influence the respondent's current alcohol use. To accomplish this, I first modeled basic sociodemographic information on drinking status. I then add stressors in the second model, and coping mechanisms in the third. In addition to the nested model approach, I will also check for moderating effects using interactions between select

stressors and coping mechanisms. I will examine interactions between discrimination and social preference, discrimination and social support, ACEs and social preference, and ACEs and social support. These interactions are performed by running separate analysis for low (approximately 60% of the sample) and high (approximately 40% of the sample) levels of social support and social preference, respectively. I then examine the change in coefficients in ACEs and discrimination.

Hypothesis and Measures

Following the modified trauma model, I suspect that Native Americans with higher incidences of stressors such as ACEs and household dysfunction will be more likely to be current drinkers. Experiencing adverse childhood experiences, household dysfunction, and poverty before the age of 18 may have lasting implications on the decision to drink. I also expect experiencing discrimination in the past year to increase the likelihood of being a current drinker. I am particularly interested in how having a biological parent with an alcohol problem influences the respondent's current drinking status, since this variable serves as the "nature" in the nature versus nurture argument. Seeing a parent with an alcohol problem could also make an individual more likely to abstain from alcohol to avoid suffering a similar fate.

The conceptual model suggests that coping mechanisms will lead to less risky drinking, as well as moderate the negative effects of the stressors experienced by American Indians. The coping mechanisms, particularly enculturation, should directly reduce the likelihood of being a current drinker and moderate the effect of the stressors. Although the model predicts that social networks will decrease the likelihood of being a current drinker, in this case having a large

number of close or instrumental ties may increase the opportunities to drink. If these network ties are also Native American, they could have even more influence over drinking patterns.

Results

First, basic descriptive statistics of predictor variables are shown. All significance tests are performed in comparison to current drinkers in both descriptive tables and the multinomial logistic regression. Current drinkers are more likely than lifetime abstainers to be male, and are significantly younger than lifetime abstainers and former drinkers. As a whole, current drinkers also tend to have higher education levels and higher incomes. No regional or city type differences are apparent between these groups of American Indians.

Table 5.1 Descriptive Statistics of Sociodemographic Variables by Drinking Status (N=459)

	Current Drinker	Lifetime Abstainer	Former Drinker
	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)
Male	136 (70.83%)	13*** (6.77%)	43 (22.40%)
Mean Age	44.73 (14.25)	52.69*** (18.54)	55.89*** (14.69)
20-30	50 (76.92%)	10 (15.38%)	5** (7.69%)
31-45	115 (77.18%)	13** (8.72%)	21*** (14.09%)
46-60	81 (57.45%)	19 (13.48%)	41† (29.08%)
61+	39 (37.50%)	25*** (24.04%)	40*** (38.46%)
Coupled	170 (64.39%)	36 (13.64%)	58 (21.97%)
Children Present in the Home	104 (72.22%)	19 (13.19%)	21** (14.58%)
Less than HS	34 (44.16%)	20*** (25.97%)	23* (29.87%)
HS Degree	75 (57.69%)	24 (18.46%)	31 (23.85%)

	Current Drinker	Lifetime Abstainer	Former Drinker
	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)
Some College	112 (67.88%)	15* (9.09%)	38 (23.03%)
College Degree	64 (73.56%)	8† (9.20%)	15† (17.24%)
Paid work in PY	207 (70.41%)	32*** (10.88%)	55*** (18.71%)
Insurance Coverage in PY	210 (66.67%)	39* (12.38%)	66* (20.95%)
Mean Household Income	55,076 (48,681)	31,515*** (25,328)	33,136*** (26,785)
Low ($2,500-22,500)	78 (47.27%)	34*** (20.61%)	53*** (32.12%)
Middle ($27,500-55,000)	115 (65.34%)	23 (13.07%)	38 (21.59%)
High ($55,001-321,522)	92 (77.97%)	10** (8.47%)	16*** (13.56%)
Northeast Region	53 (57.61%)	16 (17.39%)	23 (25.00%)
Midwest Region	56 (62.92%)	13 (14.61%)	20 (22.47%)
South Region	113 (63.13%)	26 (14.53%)	40 (22.35%)
West Region	63 (63.64%)	12 (12.12%)	24 (24.24%)
City Community	104 (63.03%)	22 (13.33%)	39 (23.64%)
Suburb Community	144 (64.00%)	32 (14.22%)	49 (21.78%)
Rural Community	37 (53.62%)	13 (18.84%)	19 (27.54%)

Source: Wave 2 NESARC

Notes: Significance Compared to Current Drinkers, p<.10†, p<.05*, p<.01**, and p<.001***.

Table 5.2 Descriptive Statistics of Stressors by Drinking Status (N=459)

	Current Drinker	Lifetime Abstainer	Former Drinker
	N (%) Mean (s.d.)	N (%) Mean (s.d.)	N (%) Mean (s.d.)
Adverse Childhood Experiences	1.86 (1.67)	1.28* (1.74)	1.93 (1.61)
Physical Neglect	113 (62.09%)	18† (9.89%)	51 (28.02%)
Physical Abuse	134 (66.67%)	21* (1.045%)	46 (22.89%)
Verbal Abuse	146 (63.48%)	24* (10.43%)	60 (26.09%)
Sexual Abuse	62 (69.66%)	8† (8.99%)	19 (21.35%)
Witnessed Marital Aggression	76 (62.30%)	15 (12.30%)	31 (25.41%)
Dysfunction in Childhood Home	0.69 (1.11)	0.51 (0.76)	0.75 (1.14)
Parent w/Alcohol Problem	93 (61.18%)	18 (11.84%)	41 (26.97%)
Parent w/ Drug Problem	25 (73.53%)	3 (8.82%)	6 (17.65%)
Parent in Jail	32 (61.54%)	6 (11.54%)	14 (26.92%)
Parent Mental Problem	23 (71.88%)	3 (9.38%)	6 (18.75%)
Parent Suicide Attempt	20 (66.67%)	2 (6.67%)	8 (26.67%)
Parent Committed Suicide	4 (36.36%)	2 (18.8%)	5† (45.45%)
Ever Received Welfare	69 (71.13%)	14 (14.43%)	14 (14.43%)
Average Years on Welfare	6.4 (5.53)	3.4 (3.34)	6.31* (5.63)
Alcoholic Bio. Parent	109 (65.66%)	10*** (6.02%)	47 (28.31%)
Discrimination	0.246 (0.431)	0.149† (0.359)	0.196 (0.399)

Source: Wave 2 NESARC

Notes: Significance Compared to Current Drinkers, p<.10†, p<.05*, p<.01**, and p<.001***.

Moving on to stressors, lifetime abstainers have suffered fewer cumulative adverse childhood experiences than current drinkers. Each measure except witnessing aggression toward one's mother is at least marginally significant, although there appear to be no difference between former drinkers and current drinkers in this regard. The cell sizes for the components of household dysfunction are quite small, but there appear to be no major statistical differences between groups. Children of alcoholics are far less likely to be lifetime abstainers than current drinkers. Lifetime abstainers also report less discrimination than current drinkers.

Each aspect of enculturation is significantly higher among lifetime abstainers than current drinkers. Social preference and strength of racial identity is also significantly higher among former drinkers than current drinkers. Former drinkers have the highest level of social support, but there are no differences in terms of social network size.

Table 5.3 Coefficients of Positive Coping Mechanism by Drinking Status (N= 459)

	Former Drinker vs. Lifetime Abstainer		Lifetime Abstainer vs. Current Drinker		Former Drinker vs. Current Drinker	
	Coef.	Std.	Coef.	Std.	Coef.	Std.
Language Preferences	-0.092*	0.037	0.112***	0.030	0.020	0.036
Social Preferences	-0.083†	0.045	0.189***	0.041	0.106**	0.035
Strength of Racial Identity	-0.037	0.025	0.074***	0.022	0.037*	0.018
Social Support	-0.024	0.027	-0.016	0.024	-0.040*	0.019
Number of Close Ties	-0.022	0.019	0.030	0.019	0.007	0.017
Number of Instrumental Ties	-0.028	0.246	-0.005	0.021	-0.026	0.019

Source: Wave 2 NESARC

Notes: Significance levels, p<.10†, p<.05*, p<.01**, and p<.001***.

After describing differences between individuals of these drinking statuses, I will now test the modified trauma for American Indian model. This analysis uses current drinkers as the

reference category to better describe the relationship between the various independent factors and drinking status, though differences may sometimes be more apparent when using lifetime abstainers as a reference group. These latter results are available in Appendix A.

Table 5.4a. Multinomial Regression Results: Relative Risk Compared to Current Drinkers (N=459)

	Model 1 Sociodemographic Factors			
	Lifetime Abstainers		Former Drinkers	
	RRR	95% CI	RRR	95% CI
Male	0.239***	0.121-0.474	0.720	0.440-1.177
Age	1.029*	1.006-1.053	1.046***	1.026-1.066
Coupled	1.151	0.603-2.197	1.191	0.699-2.032
Education (Ref: <High School)				
High School	0.732	0.324-1.653	1.015	0.474-2.187
Some College	0.324*	0.135-.777	0.989	0.465-2.105
College Degree	0.327*	0.112-0.951	0.642	0.259-1.560
Health Insurance	0.818	0.414-1.614	0.804	0.445-1.442
Income (Ref: Low-<25,000k)				
Mid (27,500k-55,000k)	0.691	0.327-1.461	0.629	0.333-1.188
High (55,001k +)	0.443	0.163-1.206	0.370*	0.161-0.852
Employed	0.775	0.395-1.524	0.981	0.548-1.758
Children under 18 in Home	1.179	0.565-2.459	0.873	0.463-1.646
Community Type (Ref: City)				
Suburb	1.076	0.561-2.064	0.953	0.559-1.626
Rural	1.607	0.667-3.873	1.615	0.760-3.418
Community Type (Ref: City)				
Midwest	0.641	0.255-1.610	0.672	0.307-1.472
South	0.791	0.360-1.739	0.727	0.372-1.421
West	0.729	0.297-1.791	0.965	0.462-2.015
Log Likelihood -368.402				
Degrees of Freedom 16				
Source: Wave 2 NESARC				
Notes: Significance compared to Current Drinkers, p<.10†, p<.05*, p<.01**, and p<.001***.				

In terms of sociodemographic differences, it is no surprise that males are less likely to be lifetime abstainers than current drinkers. However, there is no difference between men and women in the likelihood of being a current or former drinkers in this respect. Older individuals are more likely to be lifetime abstainers and former drinkers. Having a high income decreases the relative risk of being a former drinker compared to a current drinker. Having at least some college or a college degree also decreases the likelihood of being a lifetime abstainer relative to being a current drinker.

When stressors are added to the model, some of these relationships change slightly. For instance, age no longer increases the likelihood of being a lifetime abstainer versus a current drinker, though it persists for former drinkers. There are mixed findings in regard to actual stressors. Experiencing adverse childhood experiences decreases the likelihood of being a lifetime abstainer relative to a current drinker, as predicted in the model. Receiving welfare as a child decreases the likelihood of being a former drinker compared to current drinkers. Discrimination has no effect on drinking status. Having an alcoholic parent decreases the risk of being a lifetime abstainer, though it increases the risk of being a former drinker.

After controlling for positive coping mechanisms, the moderately significant effects of ACEs disappear, though the influence of having an alcoholic parents remains. Enculturation variables language preference and social preference increase the likelihood of being a lifetime abstainer compared to being a current drinker. Social preference and close social ties increase the likelihood of being a former drinker relative to a current drinker.

Table 5.4b Multinomial Regression Results: Relative Risk Compared to Current Drinkers (N=459)

	Model 2 Including Stressors				Model 3 Including Positive Coping Mechanisms			
	Lifetime Abstainers		Former Drinkers		Lifetime Abstainers		Former Drinkers	
	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Male	0.227***	0.113-0.457	0.729	0.442-1.203	0.259***	0.125-0.536	0.763	0.456-1.276
Age	1.019	0.995-1.043	1.045***	1.024-1.066	1.016	0.991-1.042	1.046***	1.024-1.068
Coupled	1.179	0.604-2.300	1.252	0.726-2.162	1.394	0.694-2.800	1.233	0.705-2.157
Education (Ref: < Hs)								
High School	0.698	0.298-1.635	1.032	0.475-2.241	0.677	.274-1.673	0.978	0.438-2.183
Some College	0.274**	0.109-0.687	0.857	0.398-1.846	0.302*	.115-.795	0.838	0.379-1.853
College Degree	0.272*	0.089-0.831	0.563	0.224-1.415	0.299*	.092-.974	0.619	0.239-1.602
Health Insurance	0.725	0.356-1.475	0.771	0.424-1.402	0.752	.351-1.607	0.739	0.398-1.371
Income (Ref: Low-<25,000k) Mid (27,500k-55,000k)	0.786	0.360-1.715	0.627	0.327-1.202	1.476	.710-3.067	0.666	0.343-1.291
High (55,001k +)	0.553	0.197-1.556	0.342	0.147-.797	0.478	.163-1.402	0.349*	0.147-0.815
Employed	0.638	0.316-1.288	0.987	0.542-1.797	0.749	.348-1.611	1.143	0.614-2.128
Children under 18 in Home	1.186	0.550-2.561	0.923	0.487-1.749	1.180	0.684-4.762	0.985	0.512-1.895
Community Type (Ref: City)								
Suburb	1.283	0.650-2.533	0.922	0.535-1.588	1.476	.710-3.067	0.864	0.492-1.518

	Model 2 Including Stressors				Model 3 Including Positive Coping Mechanisms			
	Lifetime Abstainers		Former Drinkers		Lifetime Abstainers		Former Drinkers	
	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Rural	1.739	0.693-4.363	1.552	0.725-3.324	1.804	.684-4.762	1.427	0.649-3.136
Region (Ref: Northeast)								
Midwest	0.576	0.218-1.521	0.604	.272-1.343	0.594	.220-1.602	0.580	0.257-1.308
South	0.715	0.318-1.610	0.721	0.365-1.424	0.675	.288-1.582	0.761	0.380-1.524
West	0.578	0.228-1.462	0.995	0.468-2.115	0.620	.235-1.637	1.052	0.487-2.272
Adverse Childhood Experiences	0.819†	0.663-1.010	1.008	0.854-1.189	0.836	.339-1.045	1.024	0.861-1.217
Household Dysfunction	1.089	0.778-1.524	1.030	0.797-1.330	1.084	0.755-1.557	1.060	0.810-1.387
Welfare	0.790	0.361-1.729	0.421*	0.208-.853	0.840	.370-1.908	0.415*	0.203-0.848
Discrimination	0.718	0.315-1.637	0.914	0.494-1.690	0.735	.308-1.756	0.942	0.492-1.803
Alcoholic Parents	0.308**	0.135-0.703	1.607†	0.915-2.821	0.317**	.135-.743	1.653†	0.928-2.945
Language Preference					1.082*	1.004-1.165	1.004	0.922-1.094
Social Preference					1.152**	1.041-1.274	1.084†	0.999-1.175
Ethnic Identification					1.008	0.955-1.064	1.005	0.964-1.047
Social Support					0.979	0.921-1.041	0.967	0.922-1.015
Close Social Ties					1.010	0.960-1.064	1.042†	0.998-1.087
Instrumental Social Ties					1.022	0.967-1.080	0.977	0.932-1.025
Log Likelihood	-351.918				-340.490			
Degrees of Freedom	21				27			
Change in χ^2	27.74** / 5 df				21.55* / 6 df			

Source: Wave 2 NESARC

Notes: Significance compared to Current Drinkers, p<.10†, p<.05*, p<.01**, and p<.001***.

Table 5.5: Relative Risk Ratios of Results from Analysis of ACEs and Discrimination Effects within Subgroups of High and Low Levels of Social Support and Social Preference

	Lifetime Abstainer vs. Current Drinker	Former Drinker vs. Current Drinker	Former Drinker vs. Lifetime Abstainer
	RRR	RRR	RRR
Model 1: Low Social Support (N=302)			
ACEs	1.088	1.079	0.992
Discrimination	0.939	1.337	1.423
Model χ^2 (df)	108.37*** (52)		
Model 2: High Social Support (N=157)			
ACEs	0.262**	0.944	3.600**
Discrimination	0.615	0.234†	0.380
Model χ^2 (df)	111.51*** (52)		
Model 3: Low Social Preference (N=231)			
ACEs	0.732†	1.309	1.789**
Discrimination	1.123	0.396	0.352
Model χ^2 (df)	105.85*** (52)		
Model 4: High Social Preference (N=238)			
ACEs	0.862	0.921	1.068
Discrimination	0.481	1.399	2.912
Model χ^2 (df)	112.52*** (52)		

Source: Wave 2 NESARC

Notes: Relative Risk Ratios are shown (RRR). Significance Levels p<.10†, p<.05*, p<.01**, and p<.001***.

If these coping mechanisms are truly moderating or buffering the effects of stress, analyses would show that American Indians in groups of high social support and high social preference for Native peers are less impacted by experiencing ACEs and perceived racial discrimination than respondents in the low groups. In Model 2 of Table 5.5, ACEs significantly decrease the likelihood of being a lifetime abstainer relative to being a current drinker in the high social support group, and significantly increase the likelihood of being a former drinker relative

to a lifetime abstainer. Experiencing perceived racial discrimination moderately decreases the relative risk (RRR=0.234) of being a former drinker compared to being a current drinker in the high support group (Model 2), but not in the low social support group (Model 1) (RRR=1.337).

For every unit increase in ACEs (Model 3), the relative risk of being a former drinker relative to a lifetime abstainer increases significantly by a factor of 1.789 for the respondents with low social preference for Native peers. Although the relationship is also positive in the high social preference group. 1.068, (Model 4), it is not statistically significant. Each unit increase in ACEs decreases the relative risk of being a lifetime abstainer versus a current drinker at a marginally significant level for the low social preference group (Model 3), but is not significant for the high social preference group (Model 4). There are no significant differences between social preference groups for discrimination. This examination shows some changes in effects of the specific stressors depending on levels of coping/support suggesting the moderating feature of Figure 1 is potentially important and contributes to a better understanding of how the historical trauma perspective works by incorporating these interactions.

Discussion and Conclusions

Few sociodemographic factors increase or decrease the likelihood of being a former or current drinker relative to being a lifetime abstainer. The factors that do influence drinking status, however, are consistent. Women are more likely than males to be lifetime abstainers, and younger individuals are the most likely to be current drinkers. Having some college or a college degree and being in the high income category consistently increased the likelihood of being a current drinker compared to being a lifetime abstainer.

After controlling for sociodemographic factors, only one stressor in this model increases the likelihood of being a current drinker. Having a biological parent with an alcohol problem decreases the likelihood of being a lifetime abstainer and increases the likelihood of being a former drinker relative to being a current drinker. The only other childhood factor related to drinking status is receiving welfare, and this factor only decreases the likelihood of being a former drinker compared to being a current drinker. Experiencing racial discrimination does not influence drinking status. This finding indicates that American Indians do not gravitate toward alcohol because of recent discrimination. Compared to other racial minorities, American Indians report experiencing less discrimination, as shown in the previous chapter. Since the blood quantum of respondents is unknown, respondents may "pass" for being some other race and therefore not feel discriminated against for their heritage.

The most likely outcome for a Native American in this sample with an alcoholic parent is to be a former drinker. Even though having alcoholic parents makes a person more likely to be a current drinker compared to being a lifetime abstainer, former drinkers are marginally more likely to have alcoholic parents. In this sample, just under 45% of the 107 former drinkers have been diagnosed with alcohol abuse or dependence sometime in their lifetime. It is possible that American Indians exposed to alcoholism by their parents are quicker to realize their own problems and seek treatment.

The coping mechanisms posited to help decrease drinking provide mixed results. Language preference and social preference, two of three measures of enculturation, support the notion that aspects of the American Indian culture protect individuals against alcohol use. High levels of preference for a native language increase the likelihood of being a lifetime abstainer and former drinker relative to current drinkers, while strong social preference for other Native

Americans only influences the likelihood between lifetime abstainers and current drinkers. However, one's sense of an ethnic identity does not influence drinking status. Close social ties increase the likelihood of being a former drinker relative to a current drinker. The interaction effects yield mixed results. Model 3 in which more assimilated, or less enculturated, American Indians are more impacted by ACEs (more likely to be current drinkers than lifetime abstainers) than those with higher social preference is the only relationship predicted by the interaction in the conceptual model. However, this same relationship of ACEs increasing the likelihood of being a current drinker rather than a lifetime abstainer is also present in the high social support group but not the low social support group. The finding that those with higher levels of social support are more impacted by childhood stressors is contradictory to the conceptual model.

Having shown that measures of enculturation are higher for lifetime abstainers than current drinkers, there is support for the notion that these factors are protective against alcohol misuse. In the next chapter, I will test the relationship of these variables among current drinkers. Chapter 6 will investigate beverage preference and specific aspects of consumption.

CHAPTER 6: WHAT TO DRINK AND HOW MUCH

In the previous chapter, I established that stressors such as having alcoholic parents made Native Americans in this sample more likely to be former and current drinkers than lifetime abstainers. Although no other stressors in the modified trauma model increase the likelihood of being a current drinker, enculturation was a protective factor. I will now explore specific drinking behaviors among current drinkers. Continuing my argument that childhood and current stressors lead to greater quantities of alcohol and potentially misuse, I predict that higher degrees of stressors will increase consumption of each beverage. I will also look for continued protective effects of enculturation. It is possible that American Indians will also be drawn to beverages that are easy to obtain due to low cost or easy availability, such as beer, or high in alcohol content, such as liquor.

Why Beverage Choice Matters

Beverage choice has been linked to future risk of alcohol use disorders (AUD) (Felnsborn-Madsen et al. 2008). A Danish study discovered that men drinking exclusively distilled spirits and beer had a higher risk of developing AUD compared to those who drank at least 35% wine. Regardless of total alcohol consumption, drinkers who include wine in their alcoholic consumption have lower risk of AUD. Although Plugge, Fletcher and Stewart-Brown (2001) conclude that the age and gender are more related to the risk of injury than a specific type of alcoholic beverage, other research finds that different alcoholic beverages are associated with different behaviors and outcomes. A study by Smart (1996) makes 5 major findings:

> 1) after spirits consumption blood alcohol concentrations rise more quickly than after beer; 2) for most behavioral tasks beer creates less impairment than brandy at the same dose levels; 3) brandy also leads to more emotional and aggressive responses; 4) those who drink beer or beer and spirits have more alcohol related problems than others; and 5) beer drinkers are more likely than others to drink and drive, to be arrested for drinking-driving and to be in alcohol related accidents. (P.77)

Although previous studies have suggested that moderate drinking has been linked to decreased risk of cardiovascular disease and lower risk of mortality for all causes in middle aged and older adults, new research by Nelson et al. (2013) on the relationship between alcohol and cancer suggests that alcohol is not safe in any quantity. Increased alcoholic beverage consumption has been linked to lower quality diets for both men and women, partially due to the energy intake from alcoholic beverages (Breslow et al. 2010). Consuming alcohol has also been linked to increased caloric intake. The average adult in the United States consumes 100 calories from alcohol each day (Nielson et al. 2012). In fact, 19% of men consume more than 300 calories a day from alcohol, compared to only 6% of women consuming this amount. Most literature regarding liquor consumption is centered on advertising in minority neighborhoods. No research to date focuses on the preference of coolers or lifestyle choices associated with that preference, likely because the proportion of individuals preferring this beverage is very small.

Still, individuals who prefer wine over other alcoholic beverages tend to have healthier lifestyle choices, with more fruit and vegetable consumption and less cholesterol and saturated fat, though these findings are confounded by socioeconomic status (Barefoot et al. 2002; Johansen et al. 2006). Similarly, Groenback et al. (1999) find that light and moderate wine drinkers report better health than non-drinkers or light or moderate drinkers of other alcoholic beverages. Both high and low wine consumption among older adults exhibit a lower mortality risk compared to abstainers (Holahan et al. 2012). Wine drinkers also are more likely to take vitamin supplements and have college degrees compared to drinkers of other alcoholic beverages, and less likely to have Barrett's esophagus, a disorder affecting the lining of the esophagus (Kubo et al. 2009). Wine drinkers have been found to purchase healthier food items

like fruits, vegetables, low fat cheese, poultry, olives, cooking oil, and meat compared to beer drinkers (Johansen et al. 2006). They also have "higher education and household incomes, lower prevalence of current smoking, higher intakes of dietary fiber, potassium, vitamin E, and total carotenoids, lower total fat intakes and higher amounts of fruits, vegetables, and grain products" than drinkers of other beverages (McCann et al. 2003: 13).

Drinkers tend to underestimate the intoxicating effects of beer, which helps explain its over representation in driving while intoxicated cases, particularly for young men (Greenfield and Rogers 1999). While a preference for beer does not directly influence drunk driving behavior, young men who drink at bars and restaurants are more likely to choose beer and to drive under the influence of alcohol (Gruenewald 2000). Beer is also consumed predominantly or exclusively in almost 75% of binge drinking episodes, likely due to "lower excise taxes and relatively permissive sales and marketing practices" compared to other alcoholic drinks (Naimi et al. 2007: 188). Beer also accounts for one third of all alcohol consumption among pregnant urban Native American women (Graves and Kuskutas 2006). A Danish study (Flensborg-Madsen et al. 2008) found that when beer drinking exceeded 35% of all alcohol consumption for women, women's risk of alcohol use disorders increased, though distilled spirits had no influence on AUD risk for men or women. Beer drinking is also associated with less healthy food choices than wine drinkers, buying more prepared cooked dishes, butter, sausages, soft drinks, lamb, sugar, chips, and pork (Johansen et al. 2006).

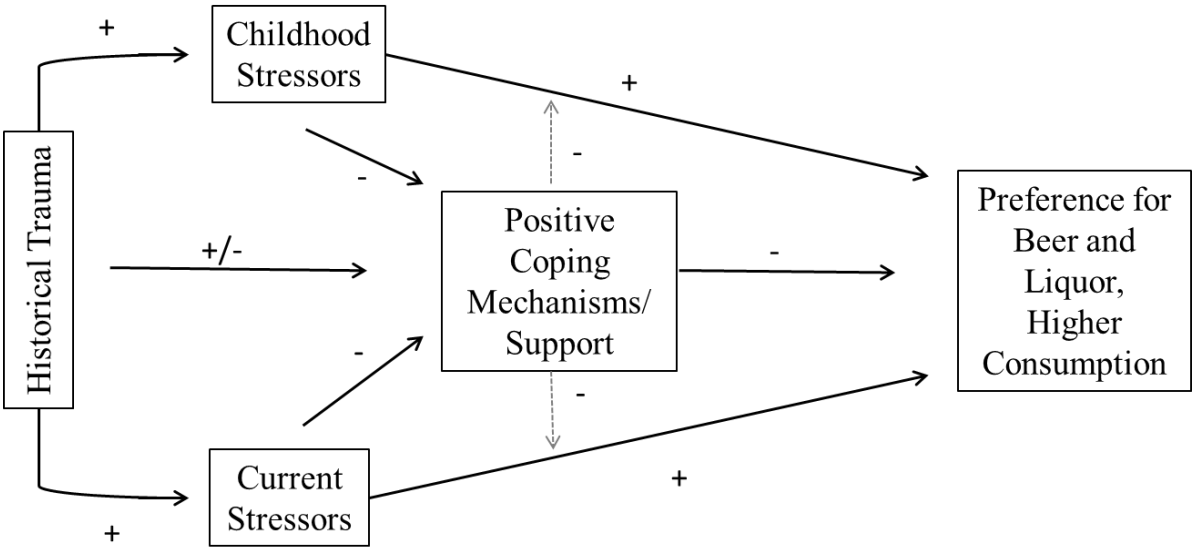

Figure 6.1 Modified Trauma Model for American Indians for Beverage Preference and Actual Consumption

What Influences Beverage Preference and Consumption

Drinkers may select beverages based on a variety of reasons, including cost, opportunity, availability, taste preference, cultural practices, and expectancies. In this analysis, preference is defined as the most frequently consumed beverage. Expectancies are based on how an individual wants to feel, or perhaps even an avoidance based on past experiences with a particular beverage. In an Implicit Association Test (IAT) study, women were more likely than men to select liquor and wine images, while men selected more images of beer. Beer and liquor were the beverages of choice for heavy episodic drinkers (Lindgren et al. 2012).

Expectancies may help explain why individuals are drawn to specific types of alcoholic beverages, based on how they are currently feeling or how they want to feel. In the context of this model, respondents should be drawn to stronger alcoholic beverages and consume more of them in an effort to escape from their trauma. Evidence of this process has been proven among

American Indian adolescents. Tingey et al. (2012) find that Mountain Apache adolescents use alcohol to "avoid problems" or "to reduce negative feelings." The authors argue that this binge drinking serves as a form of self-injury. Similarly, being “drunk or high” was cited in 64% of suicides for individuals aged 15 to 24, over 75% in suicide attempts, and almost 50% for both suicide ideation and self-injury (Barlow et al. 2012).

Women with problem drinking habits endorsed three main expectancies when drinking beer compared to drinking wine: social/sexual enhancement, relaxation, and global positive affect (Devoulyte, Stewart, and Thearston 2006). DUI offenders in a weekend program reported more positive expectancies for consuming mixed drinks and beer than for wine (Guarna and Rosenberg 2000). In an experimental study of undergraduates, Friedman et al. (2007) find that subjects given alcohol cues regarding relaxation and aggression actually exhibited these behaviors compared to control subjects who were not given alcoholic beverages.

McGregor et al. (2003) found that in a sample of adults from Winnipeg, Manitoba, Canada, wine drinkers scored the lowest on extraversion and ego strength, while beer drinkers scored the highest. In a longitudinal study that followed youths from age 12 to 18, however, researchers found no support for the notion that drinking is a coping mechanism for psychological distress, and linked drinking distilled spirits, beer, and wine to physical symptoms but not psychological changes (Hansell, White, and Vali 1999).

Methods

I will employ several statistical techniques to test the effect of these stressors and protective mechanisms on beverage preference and actual consumption according to the modified trauma model for American Indians. As seen in Figure 6.2 below, created with an

online tool (Oliveras 2007), most Native Americans report drinking several types of alcohol, though a sizable proportion prefer just beer, just liquor, or both beer and liquor. Only 107 respondents, or 37.54%, report drinking only one type of beverage. Regardless, many Native Americans have a preference for a particular type of alcohol, due to dealing with the stressors as outlined in the conceptual model, or for some other reason. This preference, defined as the most frequently consumed beverage, is examined here.

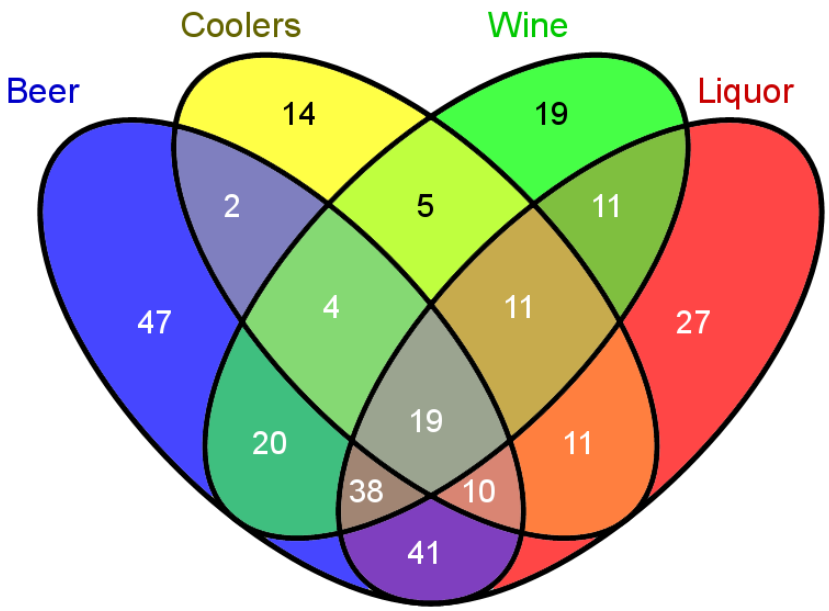

Figure 6.2 Number of Respondents Reporting Consuming Particular Beverage Type (N=285)

Source: Wave 2 NESARC

To first determine differences in alcoholic beverage choice preference, I will use another multinomial logistic regression. In order to perform this analysis, however, 21 individuals who

prefer coolers must temporarily be dropped due to small cell sizes preventing reliable estimates for other choices. The remaining outcomes are no preference, preference for beer, preference for wine, or preference for liquor. These preferences are based on the frequency of consumption.

For the next step of the analysis, I will use negative binomial models to predict the counts of beverages usually consumed on days the respondent drank that beverage, as well as the most a respondent drank on those days. This type of count model is appropriate given the over-dispersion of in the data, which was tested in these models. Since this sample is limited to current drinkers, "certain" zeros have already been removed from the analysis. Therefore, a zero-inflated negative binomial model, which would model individuals are certain to have zero consumption (those who did not drink in the past year) separately from those who simply chose not to drink a particular type of beverage, is not necessary or appropriate.

As in the previous chapter, I first test sociodemographic factors and their influence on each beverage type. Next, I add stressors, which I hypothesize will increase the quantity of each beverage consumed, particularly for higher alcohol content beverages such as liquor. Finally, I will introduce coping mechanisms. According to the modified trauma for American Indians model, enculturation, social support, and social network ties should decrease alcohol use, as well as counteract these stressors through interactions. I will investigate potential buffering effects of high social support compared to low social support and high social preference for American Indian peers compared to low social preference by performing a stratified analysis. This process is repeated for each type of beverage separately.

Results

First, a simple descriptive table of beverage preference in the sample is a good starting point for this analysis. Similar to other racial/ethnic groups as shown in Chapter 4, beer is overwhelmingly the most popular beverage preference. Having no preference (or equal preference for two or more beverages), preference for wine, and preference for liquor are fairly similar. Only 21 respondents report preferring coolers to other types of alcoholic beverages.

Table 6.1 Beverage Preference (Most Frequently Consumed Beverage) of American Indians (N=285)

Beverage Preference	N (%)
No Preference	54 (18.95%)
Beer	115 (40.35%)
Coolers	21 (7.37%)
Wine	44 (15.44%)
Liquor	51 (17.89%)

Source: Wave 2 NESARC

A multinomial logistic regression of beverage preference suggests significant differences between groups are almost exclusively sociodemographic factors, so this table is not shown here. Males are more likely to prefer beer over having no preference. Older individuals and those with children present in the home are more likely to prefer liquor over having no preference. When stressors and coping mechanisms are shown to influence beverage choice, it is not always as expected in the conceptual model. For instance, experiencing perceived discrimination

decreases the likelihood to prefer beer compared to those having no alcoholic beverage preference. Similarly, experiencing perceived racial discrimination decreases the likelihood of preferring liquor over no preference. Preferring Native American peers decreases the likelihood of preferring beer or wine, compared to those preferring liquor. Unexpectedly, the rates of discrimination are highest among American Indians with no preference and a wine preference. In addition to these relationships, a greater number of instrumental ties decreases the likelihood of being a wine drinker relative to being a beer drinker.

To investigate the potential buffering qualities of coping mechanisms on stressors, I also test interaction models using a stratified sample approach. Since cell sizes became too small for wine drinkers in the group of respondents with high social preference for same race peers, I will only examine interactions between social support and ACEs and discrimination. For a multinomial logistic regression using liquor as the referent beverage, experiencing perceived racial discrimination increases the likelihood of having no preference in the low social support group, but not in the high social support group. However, ACEs increase the likelihood of preferring beer and experiencing racial discrimination decreases the likelihood of preferring beer in the high social support group. When the reference group in no preference, experiencing perceived racial discrimination significantly decreases the likelihood of being a liquor drinker for those with low social support. This effect is not found in the high social support group and the direction of coefficients is switched but not significant.

Table 6.2 Negative Binomial Regression Results: The Average Quantity of Liquor Usually Consumed on Days Respondent Drank (N=285)

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Male	0.444**	0.142	0.473***	0.143	0.470***	0.144
Age	-0.016**	0.006	-0.017**	0.006	-0.016**	0.006
Coupled	-0.023	0.148	-0.096	0.148	-0.111	0.151
Education (Ref: < Hs)						
High School	-0.113	0.235	-0.155	0.236	-0.164	0.239
Some College	-0.275	0.228	-0.319	0.233	-0.359	0.236
College Degree	-0.297	0.281	-0.321	0.288	-0.304	0.295
Health Insurance	0.052	0.174	0.080	0.174	0.050	0.176
Income (Ref: Low-<25,000k)						
Mid (27,500k-55,000k)	0.015	0.190	0.014	0.193	0.026	0.192
High (55,001k +)	-0.078	0.236	-0.089	0.236	-0.116	0.235
Employed	-0.336†	0.175	-0.384*	0.176	-0.347*	0.176
Children under 18 in Home	0.058	0.154	0.032	0.157	0.120	0.162
Community Type (Ref: City)						
Suburb	0.224	0.152	0.240	0.152	0.187	0.156
Rural	-0.350	0.265	-0.284	0.267	-0.349	0.269
Region (Ref: Northeast)						
Midwest	-0.400†	0.233	-0.372	0.234	-0.391†	0.235
South	-0.073	0.197	-0.081	0.196	-0.045	0.198
West	-0.088	0.215	-0.023	0.219	-0.015	0.219
Adverse Childhood Experiences			0.078	0.048	0.072	0.050
Household Dysfunction			0.070	0.068	.098	0.068
Welfare			-0.015	0.172	-.023	0.171
Discrimination			-0.068	0.167	-.035	0.171
Alcoholic Parents			-0.092	0.161	-.066	0.163
Language Preference					-0.012	0.027
Social Preference					0.022	0.024
Ethnic Identification					-0.012	0.012
Social Support					-0.003	0.015

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Close Social Ties					0.022†	0.021
Instrumental Social Ties					-0.016	0.017
LN ALPHA	-0.731	0.254	-0.800	0.263	-0.858	0.273
ALPHA	0.482	0.122	0.449	0.118	0.424	0.116
Log Likelihood	-420.429		-417.949		-415.339	
Degrees of Freedom	16		21		27	
Change in χ^2			5.03		5.24	

Source: Wave 2 NESARC

Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.

Compared to American Indian females, males consistently drink at least 0.4 more servings of liquor. As with other beverages, increasing age is associated with fewer drinks. Being employed is also associated with less liquor consumption. Controlling for stressors in the model does not significantly affect liquor consumption in this model. The prediction that a greater number of close social ties could decrease liquor consumption is unsubstantiated here, as this analysis shows that each increase in close social ties increases predicted liquor consumption by 0.022 drinks. Slight differences emerge when I consider the most liquor consumed in a given day rather than the amount usually consumed. In addition to the significant factors identified in the previous model of the amount of liquor usually consumed, the model for most consumed in a day also sees increased consumption for individuals living in suburbs rather than cities and those who experienced greater household dysfunction as children.

Table 6.3 Negative Binomial Regression Results: The Average Quantity of Liquor Most Consumed on Days Respondent Drank (N=285)

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanism	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Male	0.496**	0.167	0.516**	0.166	0.525**	0.166
Age	-0.024***	0.006	-0.025***	0.006	-0.024***	0.006
Coupled	-0.144	0.169	-0.143	0.168	-0.185	0.172
Education (Ref: < Hs)						
High School	-0.205	0.280	-0.277	0.290	-0.296	0.292
Some College	-0.201	0.270	-0.313	0.282	-0.390	0.287
College Degree	-0.371	0.333	-0.423	0.347	-0.433	0.354
Insurance	-0.035	0.198	-0.033	0.199	-0.090	0.202
Income (Ref: Low-<25,000k)						
Mid (27,500k-55,000k)	0.121	0.219	0.189	0.221	0.183	0.221
High (55,001k +)	0.118	0.275	0.146	0.273	0.117	0.274
Employed	-0.420*	0.203	-0.502*	0.201	-0.427*	0.203
Children under 18 in Home	-0.107	0.171	-0.162	0.175	-0.041	0.181
Community Type (Ref: City)						
Suburb	0.374*	0.178	0.380*	0.177	0.305†	0.179
Rural	-0.060	0.287	0.013	0.289	-0.072	0.289
Region (Ref: Northeast)						
Midwest	-0.334	0.263	-0.323	0.261	-0.332	0.265
South	-0.012	0.232	-0.039	0.230	0.030	0.235
West	0.101	0.250	0.118	0.253	0.119	0.253
Adverse Childhood Experiences			0.092	0.057	0.093	0.059
Household Dysfunction			0.113	0.078	0.150†	0.078
Welfare			-0.138	0.200	-0.128	0.198
Discrimination			-0.002	0.195	0.052	0.197
Alcoholic Parents			-0.208	0.189	-0.177	0.191
Language Preference					-0.021	0.031
Social Preference					0.035	0.027
Ethnic Identification					-0.015	0.014
Social Support					0.003	0.018

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Close Social Ties					0.028†	0.014
Instrumental Social Ties					-0.020	0.014
LN ALPHA	0.129	0.151	0.068	0.156	0.018	0.159
ALPHA	1.138	0.172	1.070	0.167	1.018	0.162
Log likelihood	-514.390		-510.823		-507.240	
Degrees of Freedom	16		21		27	
Change in χ^2			7.09/ 5 df		7.11/ 6 df	

Source: Wave 2 NESARC

Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.

Beer is consumed by the most respondents and in the greatest quantities. Increased age, being married or living with a significant other, and educational achievement of a high school degree or more significantly decrease the predicted counts of beer consumption, while being male significantly increases beer consumption. When examining the stressors, receiving welfare marginally decreases consumption. This relationship disappears when coping mechanism are introduced into the model. One measure of enculturation, strength of ethnic identity, slightly but significantly increases the consumption of beer. This finding is contradictory to my hypothesis that enculturation would protect American Indians from higher alcohol consumption. Overall, the inclusion of these coping mechanisms does not improve the fit of the model.

Table 6.4 Negative Binomial Regression Results: The Average Quantity of Beer Usually Consumed on Days Respondent Drank (N=285)

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Male	1.057***	0.140	1.057***	0.142	1.091***	0.144
Age	-0.019***	0.005	-0.019***	0.005	-.019***	0.005
Coupled	-0.383**	0.148	-0.366*	0.148	-.317*	0.150
Education (Ref: < Hs)						
High School	-0.565*	0.228	-0.600**	0.229	-0.522*	0.232
Some College	-0.619**	0.221	-0.679**	0.227	-0.590*	0.231
College Degree	-1.019***	0.271	-1.080***	0.278	-0.955***	0.283
Insurance	-0.022	0.167	-0.027	0.167	0.014	0.169
Income (Ref: Low-<25,000k)						
Mid (27,500k-55,000k)	-0.084	0.192	-0.105	0.192	-0.113	0.191
High (55,001k +)	0.257	0.228	0.244	0.227	0.213	0.228
Employed	-0.171	0.169	-0.144	0.170	-0.092	0.173
Children under 18 in Home	-0.169	0.151	-0.135	0.155	-0.181	0.160
Community Type (Ref: City)						
Suburb	0.183	0.147	0.165	0.147	0.219	0.155
Rural	0.256	0.230	0.262	0.232	0.331	0.236
Region (Ref: Northeast)						
Midwest	0.016	0.222	-0.040	0.224	0.009	0.223
South	-0.164	0.197	-0.178	0.196	-0.221	0.196
West	0.024	0.206	0.054	0.208	0.075	0.208
Adverse Childhood Experiences			0.009	0.045	0.027	0.046
Household Dysfunction			-0.031	0.068	-0.048	0.162
Welfare			-0.289†	0.170	-0.267	0.170
Discrimination			0.119	0.159	0.046	0.162
Alcoholic Parents			0.231	0.155	0.240	0.156
Language Preference					0.026	0.025
Social Preference					-0.026	0.023
Ethnic Identification					0.022*	0.011
Social Support					-0.004	0.014
Close Social Ties					0.003	0.012

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanism	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Instrumental Social Ties					-0.003	0.012
LN ALPHA	-0.601	0.197	-0.647	0.202	-0.705	0.208
ALPHA	0.548	0.108	0.524	0.106	0.494	0.103
Log Likelihood	-478.331		-475.707		-472.462	
Degrees of Freedom	16		21		27	
Change in χ^2			5.26/ 5 df		6.50 / 6 df	

Source: Wave 2 NESARC

Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.

Two cases in the analysis of beer consumption are potential influential cases or outliers. Two men report consuming 20 and 24 beers. While these counts are almost double of the next highest count reported, there is no reason to believe that they are inaccurate. Upon closer inspection, both of these cases report having a history of alcohol abuse or dependence. One case reports the highest possible score for ethnic identity, along with ten other respondents (total 3.86%), while the other scored a 37, below 60% cumulative percent of the sample. Running the analysis without these cases yields similar results, with the coefficient of ethnic identity falling from .022* to .015, which is not statistically significant. Running a negative binomial model of the most beer consumed did not suggest any different patterns than the amount of beer consumed, and is not displayed here.

Although the models are not shown here (but are available in the Appendix), results of negative binomial models of coolers and wine usually consumed are discussed here. In Chapter 4, I established that Native Americans consume significantly more coolers than Asians in the sample, but no different from other racial/ethnic groups. In this sample of only American Indians, 76 respondents reported consuming any coolers. Across models, older individuals drink

fewer coolers. Compared to Native Americans living in the Northeast, individuals living in the West drank significantly fewer coolers. Applying the stressors to the model suggests that receiving welfare as a child actually decreases the average count of coolers. This finding goes against my hypothesis that disadvantage as a child increases alcohol use and potentially alcohol misuse. Consistent with expected findings, however, is that having an alcoholic parent increases the average cooler consumption of Native Americans. After controlling for these stressors, being male becomes moderately significant, with men consuming fewer coolers than women. No coping mechanisms seem to have any impact on cooler consumption.

Education levels are the main driving force behind wine consumption. Compared to those without a high school degree, having some college experience or a completed college degree significantly increases wine consumption. Attending college increases wine consumption over one serving. As with coolers, living in the West, compared to living in the Northeast, significantly decreases wine consumption. These may simply be regional differences.

In order to test for the moderating effects of positive coping mechanisms, I will again investigate stratified samples of high and low levels of social support and social preference. In the analysis of most liquor consumed, ACEs significantly increase consumption in the low social preference group, but not the high social preference group. This finding suggests that preferring American Indian peers does buffer the relationship between the stress of ACEs and the amount of the most liquor consumed. Unexpectedly in the analyses of beer consumption, Native Americans with a high preference for indigenous peers are more impacted by discrimination than those with low social preference. This finding could indicate that individuals who chose other American Indians are more sensitive to discrimination, which increases the number or amount of

beer usually consumed in general and the number or amount of the most beers consumed in a day on days the respondent drank most heavily.

Discussion and Conclusion

American Indian preference for beer and liquor, although significantly higher than other racial/ethnic groups with few exceptions, does not appear to be driven by stressors as outlined in the modified trauma for American Indians model. Experiencing discrimination in the past year actually is more common among those with no preference or a preference for wine. This is contrary to the expected findings that this racial group would prefer beer or liquor. No other stressors affect frequency of beverage consumption. For coping mechanisms, beer drinkers and wine drinkers have significantly lower social preference for American Indian peers compared to those who prefer liquor. The no preference group includes 44 individuals who consume beer and liquor with equal frequency, or over 16%. This group may be contributing to the lack of significant findings for beverage preference.

As this analysis shows, no independent factor consistently influences alcoholic beverage consumption. Although this finding confirms that specific characteristics impact alcoholic beverage choice and consumption, stressors such as adverse childhood experiences, household dysfunction, receiving welfare as a child, or discrimination in the past twelve months do not increase consumption for each beverage. In fact, the only stressor associated with an increase in alcohol consumption is having alcoholic parents in cooler consumption. Having received welfare as a child actually decreases cooler consumption, which is contradictory to the hypothesis that stressors increase alcohol consumption. Wine, liquor, and beer showed no increase in consumption based on stressors.

Even more unexpectedly, the factors predicted to reduce alcohol consumption actually increased consumption. Higher numbers of close social ties actually marginally raises liquor consumption, while stronger ethnic identification increases beer consumption. These close ties may actually be providing more opportunities to consume liquor. None of these proposed coping mechanisms have the expected influence on specific alcoholic beverage consumption.

However, the moderating effect of coping mechanisms as outlined in the modified trauma model does exist in some instances. American Indians with low social preference are more impacted by ACEs in how much liquor they consume on the days they drink the most than those with a high social preference for same race peers. This is a basic example of how this coping/support mechanism should work according to the underlying model. In analyses of the amount of beer consumed on a typical day and on the heaviest days, members of the high social preference group are more sensitive to the effects of discrimination and significantly increase both types of beer consumption. This result, however, appears counter to expectations of how the coping mechanisms moderate stress.

An important limitation of this study is that drinkers are likely consuming more than one type of alcoholic beverage on days that they drink. The Venn diagram also suggests that most American Indians drink a variety of beverages. There also may be alcoholic drinks not specified here, such as energy drink alcoholic beverages. To better assess how the modified trauma for American Indians model applies to excessive use, I examine binge drinking in the next chapter based on total consumption.

CHAPTER 7: BINGE DRINKING

This dissertation previously examined factors influencing the decision to drink, beverage preference, and actual consumption of those beverages. The investigation now shifts to a risky form of alcohol misuse, binge drinking. With rates of binge drinking among current drinker Native Americans in these data at almost 45%, this issue clearly has implications for this group.

As with previous chapters, the focus is not on establishing risk factors, but rather how the stressors and coping mechanisms outlined in the modified trauma for American Indians influence binge drinking decisions. In this chapter, I anticipate that known stressors for Native Americans, including adverse childhood experiences, household dysfunction, receiving welfare as a child, having an alcoholic biological parent, and experiencing racial discrimination within the past year will significantly increase the probability of binge drinking in this sample. Conversely, the coping mechanisms I have outlined previously, particularly enculturation variables, may moderate these specific stressor effects, resulting in lower binge drinking.

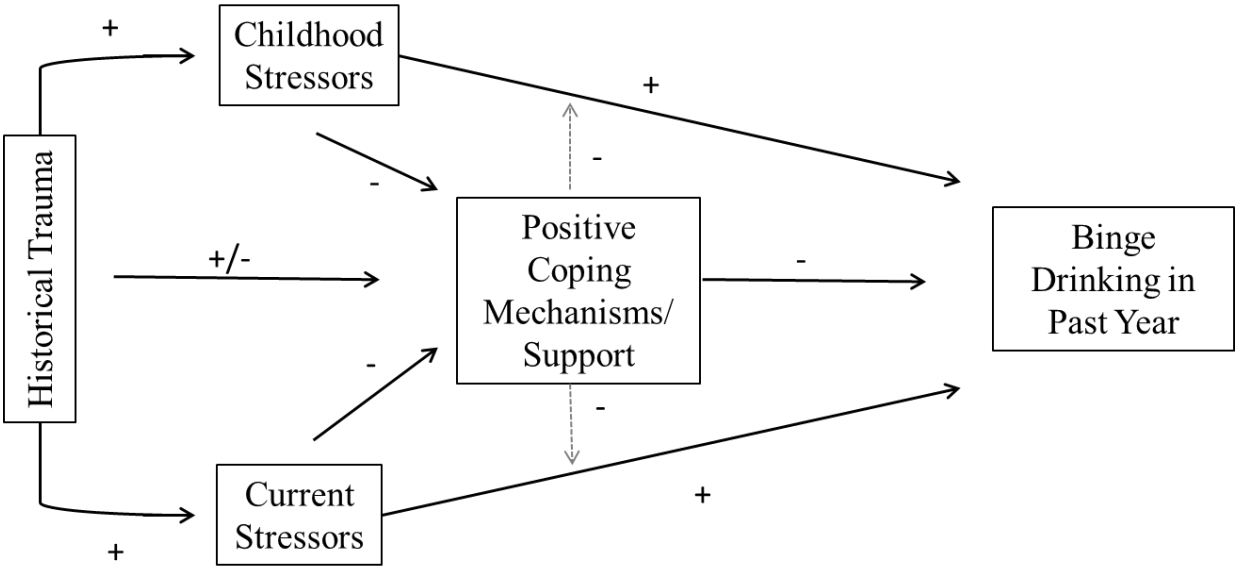

Figure 7.1 Conceptual Model of Modified Trauma for Binge Drinking

Significance of Binge Drinking

Although binge drinking in itself is harmful, it is also associated with a host of other health issues. The CDC (2012) lists numerous health problems associated with binge drinking: "unintentional injuries (e.g., car crashes, falls, burns, drowning); intentional injuries (e.g., firearm injuries, sexual assault, domestic violence); alcohol poisoning; sexually transmitted diseases; unintended pregnancy; children born with Fetal Alcohol Spectrum Disorders; high blood pressure, stroke, and other cardiovascular diseases; liver disease; neurological damage; sexual dysfunction; and poor control of diabetes." Compared to Whites, Native American binge drinkers are significantly less likely to stop binge drinking during pregnancy (Tenkku et al. 2009). Middle aged and older binge drinkers are also at significantly increased risk for developing alcohol use disorders (Chou, Liang, and Mackenzie 2011). Wantabe-Galloway et al. (2011) report that the prevalence of binge drinking is higher among American Indians in the Northern Plains region than non-Hispanic Whites, and more than American Indians living in other regions.

In addition to the direct harm done to the body when binge drinking, over-indulgence can put American Indians into dangerous situations, "resulting in increased vulnerabilities to potentially dangerous and violent situations" Yuan et al. 2006: 1583). Citing May (1995), Young and Joe (2009) estimate that binging is involved in 80% of homicides, 75% of suicides, and 65% of car accidents for Native Americans. Chou et al. (2006) find that Native Americans are at greater risk of all drinking and driving related behaviors when compared to other groups.

Beyond health issues, binge drinking incurs substantial cost beyond that of the price of the drinks. Naimi et al. (2007) points out binge drinking related costs, including "the healthcare

system, the legal and criminal justice systems, and lost productivity from those who work less effectively or miss work altogether due to hangovers or alcohol-related health and social problems, or premature death" (pg. 188)." These costs total $233.5 billion in 2006, or the equivalent of $1.90 per drink. Although total taxes on alcohol are approximately 12 cents per drink, binge drinking incurs 62 cents cost for federal, state, and local governments (Bouchery et al. 2011).

Telescoping

In alcohol research, the term "telescoping" refers to the time between the first drink to problematic drinking (Alvanzo et al. 2011). Although this analysis does not investigate the time points of drinking initiation and dependence, the general concept of a quicker progression toward misuse may be applicable for American Indians. American Indians are not significantly more likely than most other racial/ethnic groups to drink in the past year in these data, but many studies have suggested that this group is at increased risk to partake in this risky drinking behavior. Although American Indians drink only slightly more than Whites, they do engage in more binge drinking (Spillane and Smith 2007). One study finds that the rate of binge drinking for American Indians in the 26 to 49 age category is higher than the national average (Myra 2011). In another study of tribally enrolled individuals, males drink more often and more heavily than women, with respondents under the age of 30 drinking most heavily (May and Gossage 2001). Young and Joe (2009) report that 41.6% of American Indians between 18 and 25 binge drank in the past month, compared to 30.5% of respondents 26 and over, and 12.4% of adolescents aged 12 to 17. Binge drinking more than eight times a month has been found to be a reasonable diagnostic tool for both alcohol abuse and dependence, which Gilder, Gizer, and Ehlers (2012) argue are not distinct disorders for Native Americans.

Stressors and Coping Mechanisms

Frank et al. (2000) creates a context describing the influence of European contact in relation to binge drinking. Specifically, they note that the absence of social controls and presence of pressure for individuals to drink as much alcohol was available as contributing factors to alcohol misuse. Stress stemming from adverse childhood experiences, household dysfunction, and receiving welfare as a child may lead to binge drinking. Similarly, perceived racial discrimination in the past year may encourage binge drinking as an escape. Binge drinking may also be a generalized response to trauma through self-medication.

Research supports some of these findings in other racial groups. Adverse childhood experiences including physical abuse, sexual abuse, witnessing violence against one's mother, and instances of household dysfunction (i.e., adult in the household has problem with substances or suffers from mental illness) are linked to binge drinking among a random sample of women living in California (Timko et al. 2008). Findings from the Adolescent Health (AddHealth) Study suggest that risk factors for adolescent binge drinking are increased by child maltreatment (Shin, Edwards, and Hereen 2009).

Being exposed to parents' alcoholism may set a precedent of use for Native Americans. Compared to Whites, parents of Native American adolescents demonstrate less disapproval of binge drinking (Chen, Balan, and Price 2012). Dawson, Grant, and Ruan (2005) find that stress is associated to larger quantities when drinking, but not more drinking in general.

Among American Indian and White youths living on or near reservations, binge drinking was associated with both higher perceived benefits to self and norms for use (Dieterich et al.

2013). However, expectancies of socialization and benefits to others do not influence the relationship between norms for use and alcohol use (Dieterich et al. 2013).

Although there is substantial literature regarding the effect of acculturation, or adoption of a host country's behaviors, on binge drinking among Hispanics, little exists for Native Americans. Acculturative stress is frequently associated with diminished health outcomes, including alcohol use (Caetano, Vaeth, and Rodriquez 2012). Based on these findings, however, it is reasonable to posit enculturation, or that living closer to one's own culture, provides protective effects against alcohol misuse. Similarly, the family and community factors in the original model of Historical Loss are operationalized here as social support in addition to social networks.

Methods

The NESARC, a data set designed to provide insight on alcohol use issues, defines binge drinking as consuming more than four drinks for women and more than five for men on one occasion. This guideline from the NIAAA states that binge drinking is a "pattern of alcohol consumption that brings the blood alcohol concentration (BAC) level to 0.08% or more…, generally within about 2 hours" (CDC 2012). This question calculated, rather than being self-reported as in other chapters. These data also allow for the unique opportunity to test a variety of stressors and coping mechanisms in a quantitative study of American Indians with a sample size in this analysis of 285.

First, descriptive tables of characteristic of binge drinkers and non-binge drinkers helps to set the stage for the statistical analysis. After comparing characteristics of non-binge drinkers with binge drinkers, I use a logistic regression model to test presence or absence of the binge

drinking in the past year the modified loss conceptual model as outlined in Figure 7.1. Only current drinkers are considered in this analysis. As in previous chapters, I will perform a stratified analysis, separating American Indians in low social support groups from high social support groups, and low social preference groups from high social preference groups. This strategy will allow me to determine the influence of coping mechanisms on the effect of stressors.

Results

Over 50% of male drinkers engage in binge drinking in this sample, compared to just over 30% for women. One of the most striking findings is the large percentage of binge drinkers between the ages of 21 and 30. This youngest age bracket is barely less than the rate of binge drinking in all 31 to 60 year olds combined. A greater percentage of binge drinkers are single, have less than a high school education, and no insurance coverage. Characteristics associated with non-binge drinkers include being female, over the age of sixty-one, married or living with a partner, having a college degree, and living in a rural community.

Table 7.1 Characteristics of American Indian Non-Binge Drinkers and Drinkers (N=285)

	Non-Binge Drinkers N=162 (56.48%)	Binge Drinkers N=123 (43.16%)
	%	%
Sex		
Male	47.06%	52.94%***
Female	65.77%	34.23%***
Age Category		
21-30	28.00%	72.00%***
31-45	53.04%	46.96%
46-60	66.67%	33.33%*
61+	84.62%	15.38%***
Married or Cohabiting		
No	46.96%	53.04%**
Yes	63.53%	36.47%**

	Non-Binge Drinkers N=162 (56.48%)	Binge Drinkers N=123 (43.16%)
	%	%
Education Level		
Less than High School	41.18%	58.82%*
High School Degree	60.00%	40.00%
Some College	50.00%	50.00%†
College Graduate	73.44%	26.56%**
Health Insurance Coverage		
No	48.00%	52.00%†
Yes	60.00%	40.00%†
Income Level		
Low	52.56%	47.44%
Middle	55.65%	44.35%
High	61.96%	38.04%
Employed in Past Year		
No	58.97%	41.03%
Yes	56.04%	43.96%
Children in the Home		
No	60.22%	39.78%
Yes	50.96%	49.04%
Community Type		
City	56.73%	43.27%
Suburb	54.17%	45.83%
Rural	67.57%	32.43%
Region		
Northeast	54.72%	45.28%
Midwest	57.14%	42.86%
South	58.41%	41.59%
West	55.56%	44.44%
Source: Wave 2 NESARC		
Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.		

Next, I examine differences between non-binge drinkers and drinkers in terms of stressors in Table 7.2 and coping mechanisms in Table 7.2. It has previously been established that some stressors (i.e., adverse childhood experiences, alcoholic parents) make an individual more likely to be a current drinkers than former drinkers or lifetime abstainers. By limiting this sample to current drinkers, I am possibly removing some variance. However, the aim of this

chapter is to examine how the modified trauma model applies to binge drinking among current drinkers.

Table 7.2 Descriptive Differences of Stressors between American Indian Non-Binge Drinkers and Binge Drinkers (N=285)

	Non-Binge Drinkers N=162 (56.48%)	Binge Drinkers N=123 (43.16%)
	%	%
ACEs		
0	55.29%	44.71%
1	58.00%	42.00%
2	49.09%	50.91%
3	57.14%	42.86%
4	58.82%	41.18%
5	73.08%	26.92%
Household Dysfunction		
0	57.89%	42.11%
1	56.52%	43.48%
2	68.18%	31.82%
3	42.86%	57.14%
4	20.00%	80.00%†
5	50.00 %	50.00%
6	50.00 %	50.00%
Received Welfare		
No	56.48%	43.52%
Yes	57.97%	42.03%
Alcoholic Parents		
No	58.52%	41.48%
Yes	54.13%	45.87%
Experienced Perceived Discrimination		
No	58.14%	41.86%
Yes	52.86%	47.14%
Source: Wave 2 NESARC		
Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.		

Table 7.3 Means of Differences in Coping Mechanisms between American Indian Non-Binge Drinkers and Binge Drinkers (N=285)

	Non-Binge Drinkers N=162	Binge Drinkers N=123 (43.16%)
	Mean (s.d.)	Mean (s.d.)
Language Preference	7.475 (2.458)	8.016 (3.438)
Social Preference	11.377 (3.016)	10.650 (3.120)*
Ethnic Identification	35.500 (6.517)	35.748 (6.343)
Social Support	42.827 (5.280)	42.382 (5.020)
Close Social Ties	9.611 (6.513)	9.715 (6.410)
Instrumental Social Ties	6.562 (6.569)	6.049 (6.146)

Source: Wave 2 NESARC

Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.

Finally, Table 7.4 displays the logistic regression analysis of binge drinking among American Indians. Sociodemographic variables seem to have the biggest influence on whether or not an individual reports binge drinking. Being male increases the log odds of binge drinking, regardless of other variables considered. Factors decreasing the log odds of binge drinking include older age, being married or living as married, and having a college degree rather than less than a high school education. Income, region, community type, the presence of children in the home, education less than a college degree, and having insurance did not affect binge drinking.

Table 7.4 Logistical Regression Analysis of Binge Drinking among Current Drinker American Indians (N=285)

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Male	1.105***	0.291	1.063***	0.296	1.083***	0.301
Age	-.065***	0.012	-0.067***	0.013	-0.067***	0.013
Coupled	-.844**	0.306	-0.850**	0.313	-0.817*	0.318
Education (Ref: < Hs)						
High School	-0.665	0.498	-0.632	0.506	-0.568	0.519
Some College	-0.325	0.485	-0.427	0.498	-0.363	0.512
College Degree	-1.050†	0.569	-1.125†	0.589	-1.050†	0.609
Health Insurance	-.175	0.358	-0.209	0.366	-0.091	0.379
Income (Ref: Low-<25,000k)						
Mid (27,500k-55,000k)	-0.009	0.387	0.104	0.398	0.141	0.403
High (55,001k+)	0.209	0.458	0.253	0.468	0.270	0.475
Employed	-0.262	0.349	-0.300	0.356	-0.320	0.364
Children under 18 in Home	-0.041	0.306	0.018	0.315	-0.005	0.328
Community Type (Ref: City)						
Suburb	0.322	0.303	0.328	0.306	0.376	0.318
Rural	-0.343	0.478	-0.401	0.487	-0.287	0.504
Region (Ref: Northeast)						
Midwest	-0.070	0.448	-0.230	0.462	-0.216	0.474
South	-0.168	0.395	-0.218	0.402	-0.279	0.409
West	-0.046	0.426	-0.127	0.439	-0.139	0.445
Adverse Childhood Experiences			-0.107	0.096	-0.100	0.101
Household Dysfunction			0.157	0.135	0.132	0.138
Welfare			-0.465	0.251	-0.498	0.354
Discrimination			0.118	0.329	-0.033	0.345
Alcoholic Parents			0.000	0.321	-0.001	0.330
Language Preference					0.040	0.058
Social Preference					-0.054	0.048

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Ethnic Identification					0.012	0.025
Social Support					-0.029	0.030
Close Social Ties					0.002	0.025
Instrumental Social Ties					0.001	0.025
Log Likelihood	-158.963		-156.759		-155.450	
Degrees of Freedom	16		21		27	
Change in χ^2			4.30/ 5 df		2.57 / 6 df	
Source: Wave 2 NESARC						
Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.						

In previous chapters, at least one stressor has in fact influenced more alcohol use. In this analysis of binge drinking, no stressors make current drinkers more likely to binge. Although American Indians are not more likely than other racial/ethnic groups to binge drink (Chapter 4), it is unexpected that no stressors included in this analysis would encourage alcohol misuse. For a comparison, I have included a sub-analysis of Whites, Blacks, and Hispanics to demonstrate how these stressors and coping mechanisms influence other groups.

Table 7.5 Logistical Regression Analysis of Binge Drinking among Current Drinker Whites (N=11,952)

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Male	0.711***	0.042	0.725***	0.043	0.747***	0.043
Age	-0.058***	0.002	-0.059***	0.002	-0.059***	0.002
Coupled	-0.456***	0.049	-0.456***	0.049	-0.475***	0.049
Education (Ref: < Hs)						
High School	0.095	0.099	0.105	0.100	0.086	0.100
Some College	-0.020	0.097	-0.020	0.098	-0.027	0.099
College Degree	-0.233*	0.099	-0.212*	0.101	-0.199†	0.102

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Health Insurance	-0.085	0.065	-0.068	0.065	-0.081	0.066
Income (Ref: Low-<25,000k)						
Mid (27,500k-55,000k)	0.057	0.067	0.072	0.067	0.056	0.068
High (55,001k +)	0.207**	0.072	0.234***	0.073	0.216**	0.073
Employed	0.149**	0.054	0.137*	.054	0.141**	0.054
Children under 18 in Home	-0.197***	0.046	-0.204***	.048	-0.199***	0.049
Community Type (Ref: City)						
Suburb	0.013	0.046	0.010	0.047	0.014	0.047
Rural	-0.035	0.064	-0.027	0.064	-0.031	0.064
Region (Ref: Northeast)						
Midwest	0.046	0.070	0.042	0.070	0.050	0.070
South	0.091	0.059	0.094	0.060	0.099†	0.060
West	0.038	0.064	0.045	0.064	0.052	0.064
Adverse Childhood Experiences			0.107***	0.016	0.118***	0.016
Household Dysfunction			-0.020	0.021	-0.019	0.021
Welfare			-0.053	0.069	-0.064	0.070
Discrimination			0.078	0.064	0.110±	0.065
Alcoholic Parents			0.167***	0.051	0.160**	0.052
Language Preference					-0.051***	0.011
Social Preference					0.005	0.007
Ethnic Identification					0.006†	0.003
Social Support					0.007	0.005
Close Social Ties					0.009*	0.004
Instrumental Social Ties					-0.004	0.003
Log Likelihood	-6875.120		-6836.565		-6816.464	
Degrees of Freedom	16		21		27	
Change in χ^2			76.86***/ 5 df		38.21***/ 6 df	
Source: Wave 2 NESARC						
Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.						

For Whites, more types of ACEs significantly increase the probability of binge drinking, as does having alcoholic parents. This relationship persists even after coping mechanisms are introduced to the model. Preference for a language other than English significantly decreases the probability of binge drinking. Since the sample of Whites is so large, the marginal significance of strength of ethnic identity is not very meaningful. Close social ties, perhaps because of their potential to increase the opportunities to drink, actually increase the probability of binge drinking.

For Blacks, ACEs again are significant predictors of binge drinking. Receiving welfare as a child also increases binge drinking in the past year. Experiencing racial discrimination also increases binge drinking after coping mechanisms have been controlled. Enculturation measures language preference and ethnic identity are both protective factors against binge drinking, though social preference for Black peers increases binge drinking.

ACEs, receiving welfare as a child, and experiencing discrimination all increase the probability of binge drinking for Hispanics. A preference for a language other than English decreases the probability of binge drinking, though ethnic identification and close social ties increase it. Instrumental ties, in contrast to close ties, decrease the probability of binge drinking.

Table 7.6 Logistical Regression Analysis of Binge Drinking among Current Drinker Blacks (N=2,895)

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Male	0.533***	0.089	0.562***	0.090	0.598***	0.091
Age	-0.030***	0.003	-0.028***	0.003	-0.028***	0.004

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Coupled	-0.005	0.098	-0.015	0.098	-0.012	0.009
Education (Ref: < Hs)						
High School	-0.223	0.136	-0.219	0.137	-0.225	0.138
Some College	-0.468***	0.138	-0.478***	0.140	-0.458***	0.142
College Degree	-0.743	0.160	-0.733***	0.163	-0.678***	0.166
Health Insurance	-0.195†	0.103	-0.198†	0.103	-0.193†	0.105
Income (Ref: Low-<25,000k)						
Mid (27,500k-55,000k)	0.047	0.109	0.053	0.110	0.065	0.111
High (55,001k +)	0.031	0.132	0.053	0.134	0.083	0.135
Employed	-0.144	0.102	-0.136	0.103	-0.128	0.104
Children under 18 in Home	-0.066	0.095	-0.091	0.096	-0.081	0.097
Community Type (Ref: City)						
Suburb	0.016	0.090	0.036	0.091	0.043	0.091
Rural	-0.053	0.128	-0.033	0.129	-0.033	0.129
Region (Ref: Northeast)						
Midwest	0.046	0.134	0.048	0.135	0.066	0.136
South	-0.095	0.118	-0.098	0.119	-0.104	0.119
West	-0.135	0.126	-0.143	0.126	-0.136	0.127
Adverse Childhood Experiences			0.057†	0.029	0.056†	0.030
Household Dysfunction			0.023	0.044	0.025	0.044
Welfare			0.214*	0.095	0.192*	0.095
Discrimination			0.141	0.087	0.158†	0.088
Alcoholic Parents			0.113	0.101	0.111	0.102
Language Preference					-0.061*	0.026
Social Preference					0.052***	0.016
Ethnic Identification					-0.015†	0.008
Social Support					0.002	0.008
Close Social Ties					-0.000	0.007
Instrumental Social Ties					-0.007	0.026
Log Likelihood	-1723.973		-1713.247		-1702.959	

Degrees of Freedom	16	21	27
Change in χ^2		21.45***/ 5 df	19.37**/ 6 df
Source: Wave 2 NESARC			
Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.			

Table 7.7 Logistical Regression Analysis of Binge Drinking among Current Drinker Hispanics (N=3,316)

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Male	0.913***	0.078	0.960***	0.079	0.991***	0.080
Age	-0.039***	0.003	-0.037***	0.003	-0.036***	0.003
Coupled	-0.327***	0.087	-0.280***	0.088	-0.282**	0.090
Education (Ref: < Hs)						
High School	-0.138	0.115	-0.0186	0.116	-0.288*	0.122
Some College	-0.401***	0.112	-0.457***	0.114	-0.566***	0.121
College Degree	-0.684***	0.130	-0.673***	0.131	-0.745***	0.138
Health Insurance	-0.083	0.092	-0.093	0.093	-0.169†	0.096
Income (Ref: Low-<25,000k)						
Mid (27,500k-55,000k)	0.004	0.105	0.025	0.106	-0.014	0.107
High (55,001k+)	0.090	0.119	0.097	0.120	0.026	0.122
Employed	0.105	0.100	0.144	0.101	0.175†	0.103
Children under 18 in Home	-0.167*	0.085	-0.222**	0.086	-0.208*	0.087
Community Type (Ref: City)						
Suburb	0.031	0.083	0.042	0.084	-0.090	0.124
Rural	0.049	0.116	0.068	0.117	0.050	0.118
Region (Ref:Northeast)						
Midwest	-0.045	0.129	0.035	0.131	-0.093	0.132
South	-0.102	0.121	-0.069	0.123	-0.093	0.124
West	0.052	0.125	0.079	0.127	0.058	0.128
Adverse Childhood Experiences			0.046†	0.027	0.066*	0.028
Household Dysfunction			0.188	0.043	0.001	0.043
Welfare			0.545***	0.100	0.475***	0.102

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping Mechanisms	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Discrimination			0.188*	0.086	0.194*	0.087
Alcoholic Parents			0.137	0.094	0.129	0.095
Language Preference					-0.028***	0.007
Social Preference					0.015	0.013
Ethnic Identification					0.014*	0.006
Social Support					0.012	0.008
Close Social Ties					0.023***	0.007
Instrumental Social Ties					-0.014*	0.007
Log Likelihood	-2064.019		-2036.041		-2017.935	
Degrees of Freedom	16		21		27	
Change in χ^2			54.95***/ 5 df		35.64***/ 6 df	
Source: Wave 2 NESARC						
Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.						

To test the potential buffering effects of positive coping mechanisms, I performed a stratified analysis with groups of high and low social preference for American Indian peers and high and low social support. Running separate analyses for these groups reveals moderating effects of positive coping mechanisms on the effects of stressors. There were no significant differences found between groups for American Indians, suggesting that there are no moderating effects of positive coping mechanisms. Finding no crude evidence of moderation suggests the lack of relations of stressors and coping mechanisms in the main analysis is accurate and warrants further work or conceptualization of additional variables since these same stressors/coping mechanism seem to work for other ethnic groups

Discussion and Conclusion

As demonstrated in the sub-analysis of other racial/ethnic groups, some stressors outlined in the conceptual model for American Indians are successful in predicting binge drinking. The fact that these variables do not influence binge drinking outcomes for American Indians suggests that other factors are at play not captured in the model. Possible explanations for the lack of significance of these stressors and coping mechanisms is that 1) historical trauma is impacting American Indians in ways not captured in the model, or 2) that these stressors and alcohol misuse are so prevalent within this racial group that stressors have no special predictive power.

May and Gossage (2001) point out that drinking among Native Americans is most prevalent in younger ages. Since the youngest individual in this sample is 21, this analysis could be missing the riskier binge drinking behavior of youths. In these cases I am unable to investigate, adverse childhood experiences and household dysfunction may be more salient. In the age group from 20 to 30, 72% (N=36) of respondents report binge drinking in the past 12 months. In a comparative study of individuals over sixty, more non-Hispanic Whites (11.9%) and Latinos (10.8%) binge than Native Americans (9.8%).

The next and final chapter will discuss the implications of these chapters as a complete picture. Although few factors hypothesized in the modified historical loss significantly influence the selected alcohol use outcomes, their lack of significance is unique to this population and requires closer inspection.

CHAPTER 8: CONCLUSIONS

The purpose of this dissertation is to apply a conceptual model of modified trauma, based on the combining of the Historical Loss model by Walters et al. (2002), and the more general social support/stress model as presented by Pearlin and Schooler (1978), to American Indians using nationally representative data. To accomplish this task, I examined several alcohol outcomes including drinking status, alcoholic beverage preference based on frequency of consumption, actual consumption, and binge drinking. The findings, or lack thereof, are discussed in this chapter.

Although Native Americans do not stand out in their drinking status, they are more prone to heavier alcoho than Blacks to prefer coolers, less likely than Whites and Asians to prefer wine, but more likely to prefer liquor than all groups but Blacks. When it comes to actual consumption, however, American Indians consume more beer than all groups except Hispanics, and more liquor than all groups based on the average quantity of liquor consumed on days they drank the most. This analysis also finds that this group is more likely than Blacks or Asians to binge drink. In these data, their rates of alcohol abuse and dependence are significantly higher than all groups other than Whites, at a rate of 11%, and are more likely to drive under the influence of alcohol than other groups. These patterns suggest a telescoping behavior, in which American Indians are more likely to have risky alcohol behaviors despite not standing out as current drinkers.

On the surface, it seems that there is a connection between experiencing trauma in childhood and in the past year and alcohol use. The prevalence for these traumatic experiences is staggering, with almost 50% reporting verbal abuse, and triple the percentage of Asians and Pacific Islanders for experiencing sexual abuse. American Indians suffered significantly more of each type of adverse childhood experiences than all other racial/ethnic groups, with the exception

of physical neglect among Hispanics. Publications from the Adverse Childhood Experience Study consistently link these types of experiences to numerous negative health outcomes, including alcohol misuse. Similarly, American Indians are more likely than other racial ethnic groups to have a parent or caregiver in the home with an alcohol problem, at almost 33% of the sample. They are also more likely than other groups, with the exception for Blacks, to have a parent or caregiver with a drug problem. They are also more likely to have a parent attempt suicide than other groups, though rates of a completed suicide are similar to other groups. American Indians, although significantly less than Blacks, report receiving welfare more than other racial/ethnic groups. The only contemporary stressor, discrimination, suggests that this group experiences less perceived discrimination based on race compared to other minority groups.

In this dissertation, having alcoholic parents increased the likelihood of being a current drinker relative to a lifetime abstainer and increased the average count of coolers usually consumed. Research in genetics has concluded that Native Americans do not have a genetic predisposition to alcohol use and misuse (Ehlers et al. 2013). The increased risk associated with having alcoholic parents may actually be more of a legacy of historical trauma than genetics. Almost 12% of American Indians have an alcoholic biological mother, and over 30% have an alcoholic biological father. These rates are significantly higher than other racial/ethnic groups.

With just a comparison of these stressors compared to other racial/ethnic groups, a finding that these factors contribute to Native American alcohol use and misuse is expected. However, this is not the case. Measuring coping mechanisms by using many of the same cultural buffers as Walters et al. (2002) does not provide strong support for the notion that these measures are successful in ameliorating the stressors. Compared to other minority groups,

American Indians have less of a preference for a native language other than English than Asians or Hispanics, only more social preference for same race peers compared to Asians, and lower ethnic identity than other minority groups. American Indians report less social support and instrumental ties than Whites. Unlike stressors, this racial group does not stand out from other groups in terms of coping mechanisms.

Some evidence in this dissertation suggests that the relation of ACEs to current drinking is stronger among American Indians with weaker coping mechanisms, which supports the moderating role posited in the Pearlin and Schooler (1978) and Thoits (2011) aspect of the modified historical trauma model. Receiving welfare as a child also increased the risk of being a current drinker relative to a former drinker. Having alcoholic parents decreased the likelihood of being a lifetime abstainer compared to being a current drinker, but more likely to be a former drinker. However, there is some evidence that coping mechanisms in the form of language preference and social preference are more frequent for lifetime abstainers. If only a few of these factors significantly influence the decision to drink, how do they impact actual drinking behaviors?

No measures of childhood trauma influence alcoholic beverage preference as measured in this dissertation by frequency of consumption. In fact, discrimination, the only stressor used in this dissertation that actually has a significant effect on beverage preference, increases the risk of having no preference or a preference for wine relative to a preference for liquor. This finding is unexpected, since the model suggests that stressors would draw American Indians to harder types of alcohol. It is possible that having no preference for a particular beverage indicates a willingness to drink whatever is available. Social preference for American Indian peers is lower for beer drinkers and wine drinkers compared to those who prefer liquor. None of these findings

support the idea that trauma draws Native Americans into drinking beer or liquor over other beverages.

These stressors also contribute very little to the understanding of actual consumption. The quantity of beer and liquor usually consumed on day the respondent drank that particular of alcoholic beverage is not influenced by any measure of trauma or stress, and two measures thought to be coping mechanisms actually increase consumption, ethnic identification for beer and close social ties for liquor. The only stressor that appears to increase actual consumption is household dysfunction in the analysis of liquor most consumed.

As with specific beverage consumption, the modified trauma model for American Indians does not explain binge drinking outcomes. No stressors or coping mechanisms are even marginally significant. This finding is in stark contrast to other groups as shown in the sub-analysis of Whites, Blacks, and Hispanics. These factors do influence drinking behavior, but not for American Indians. The fact that these some stressors and coping mechanisms are significant predictors of binge drinking for other racial/ethnic groups but not Native Americans suggests that something unique is happening in this population. The small sample size may also contribute to the lack of statistically significant findings.

Although this dissertation failed to establish high rates of trauma and stress as a cause of high rates of alcohol consumption and misuse, it does contribute to the literature surrounding these areas of research. The lack of findings, in light of these relationships for other groups and the high rates of trauma and alcohol use and misuse of American Indians, are actually significant because of the failed model. It is possible that these instances of trauma are so prevalent among Native Americans that their presence does not impact this race as much as others. Another likely

scenario is that the conceptual model tested in this dissertation is not capturing some dimension of American Indian life that drives alcohol use. Are feelings of historical loss and grief the real factors driving these traumatic experiences and alcohol misuse as posited by Walters et al. (2002)? Information on these feelings is usually ascertained through qualitative studies on reservations, and not available in any nationally representative data sets.

The modified trauma model also indicates a buffering effect for coping mechanisms against the harm from stressors. However, every unit increase in ACEs decreased the relative risk of being a lifetime abstainer relative to a current drinker for the group with high social support but not for low social support. Although it was predicted that ACEs would make American Indians more likely to be current drinkers, this interaction suggests that those with high social support are actually more sensitive to the stress of ACEs than those with lower levels of social support. In the analyses of actual consumption habits, ACEs significantly increase the most liquor consumed in the group with low social preference, suggesting that American Indians with more preference for Native peers are protected against increased liquor consumption. However, in the beer analyses, high social preference for American Indian peers was associated with more sensitivity to discrimination, which increases consumption. This dissertation attempted to build in specific views of how social support and social preference moderate key stressors but showed very mixed results regarding how or whether such a moderation occurred. These moderating effects need both refinement and more power to better understand the value of incorporating this general framework with the historical trauma model.

Like any work, this dissertation suffers from many limitations. The bulk of trauma variables rely on a respondent recalling events from one's childhood. These recollections may be biased in some way, though this is unlikely given the nature of the events. Also, the bias of

recall and coding of questions is consistent across races, and American Indians still experience these stressors at significantly higher rates than other racial/ethnic groups.

Although the NESARC provides a unique opportunity to perform quantitative analyses from a nationally representative sample for American Indians, it does so by combining individuals of different blood quantum and tribal affiliation together. Tribal cultures are actually quite heterogeneous, and combining them may mask the influence of these stressors and coping mechanisms. The culture and daily lives of American Indians living on reservations could be very different than urban dwelling American Indians. May and Gossage (2001) contend that Northern Plain Indians experienced more disruption their cultural ways of life than Southwestern tribes. I also have no way of knowing if a respondent lives on or near a reservation using these data. Another limitation at the core of this analysis is defining how "native" a respondent is. The racial categorization used in these data considers many individuals with mixed ancestry to be Native American. According to the American Community Survey (2011), a total of 1.6% Americans are of at least partial American Indian ancestry, with only 0.8% of the total population, or half, reporting only American Indian ancestry. Apart from blood quantum, the Native American community is constantly plagued with the notion of not being "native enough." Prussing (2007) illustrates this phenomenon as concentric circles of ethnic identity, with the center circle of the most "native" being empty.

Moving forward, research with a special focus on varying amounts of blood quantum may be beneficial. This strategy may allow for more specific prevention and intervention tactics based on self-identification of race. However, many of these efforts are already performed on a tribal level, where they are most in-tune with the needs of the community. Perhaps this strategy is best suited to address the needs of each community. Further research is needed to determine

potential causes of increased alcohol use and misuse among American Indians. Longitudinal studies over the course of generations with emphasis on tribal affiliation, blood quantum, and feelings of historical grief and loss would be needed to fully test the original Historical Trauma model outlined by Walters et al. (2002). Such a data set is unlikely to be created, but future data may allow for changes in drinking behavior over time.

These data allow for the future application of the modified trauma model to other alcohol and health related outcomes. The NESARC has information on driving and riding under the influence of alcohol, as well as questions regarding seeking treatment. The existing model of modified trauma can also be expanded to include other measures of more current instances of trauma and stress.

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APPENDIX A: Relative Risk Ratios and Confidence Intervals of Selected Sociodemograhic Factors Relative to Lifetime Abstainers (N=459)

	Model 1 Sociodemographic Factors			
	Former Drinkers		Current Drinkers	
	RRR	95% CI	RRR	95% CI
Male	3.002***	1.441-6.250	4.171***	2.109-8.250
Age	1.016	0.991-1.041	0.972*	0.950-0.994
Coupled	1.035	0.511-2.098	0.869	0.455-1.660
Education (Ref: < Hs)				
High School	1.387	0.579-3.322	1.366	0.605-3.083
Some College	3.056*	1.195-7.814	3.090*	1.287-7.418
College Degree	1.967	0.600-6.444	3.063*	1.051-8.921
Insurance	0.983	0.472-2.048	1.223	0.620-2.414
Income (Ref: Low-<25,000k)				
Mid (27,500k-55,000k)	0.910	0.398-2.079	1.446	0.684-3.057
High (55,001k +)	0.836	0.268-2.611	2.258	0.829-6.149
Employed	1.265	0.598-2.679	1.290	0.656-2.535
Children under 18 in Home	0.740	0.312-1.760	0.848	0.407-1.770
Community Type (Ref: City)				
Suburb	0.886	0.433-1.811	0.929	0.484-1.783
Rural	1.005	0.392-2.579	0.622	0.258-1.499
Region (Ref: Northeast)				
Midwest	1.049	0.386-2.849	1.560	0.621-3.917
South	0.920	0.390-2.171	1.265	0.575-2.780
West	1.324	0.503-3.486	1.371	0.558-3.368
Log Likelihood -368.402				
Degrees of Freedom 16				
Source: Wave 2 NESARC				
Notes: Significance compared to Lifetime Abstainers, p<.10†, p<.05*, p<.01**, and p<.001***.				

	Model 2 Stressors				Model 3 Coping			
	Former Drinkers		Current Drinkers		Former Drinkers		Current Drinkers	
	RRR	95% CI	RRR	95% CI	RRR	95% CI	RRR	95% CI
Male	3.212**	1.506-6.850	4.405***	2.189-8.867	2.941**	1.338-6.465	3.857***	1.866-7.973
Age	1.026†	0.999-1.053	0.981	0.958-1.005	1.029*	1.000-1.058	0.984	0.959-1.009
Coupled	1.063	0.510-2.215	0.849	0.435-1.656	0.885	0.413-1.898	0.718	0.357-1.442
Education (Ref: < Hs)								
High School	1.478	0.593-3.685	1.432	0.612-3.353	1.445	0.549-3.800	1.478	0.598-3.654
Some College	3.133*	1.165-8.424	3.655**	1.456-9.178	2.775†	0.991-7.773	3.311*	1.258-8.718
College Degree	2.072	0.603-7.118	3.681*	1.204-11.257	2.074	0.570-7.548	3.349*	1.027-10.924
Health Insurance	1.064	0.489-2.318	1.380	0.678-2.809	0.983	0.430-2.247	1.330	0.622-2.845
Income (Ref: Low-<25,000k)								
Mid (27,500k-55,000k)	0.798	0.335-1.901	1.272	0.583-2.774	0.767	0.314-1.876	1.152	0.512-2.594
High (55,001k +)	0.618	0.189-2.019	1.807	0.643-5.080	0.725	0.215-2.451	2.094	0.714-6.146
Employed	1.548	0.705-3.400	1.568	0.776-3.168	1.526	0.652-3.573	1.335	0.621-2.872
Children under 18 in Home	.778	0.315-1.920	0.843	0.391-1.820	0.835	0.325-2.146	0.847	0.374-1.919
Community Type (Ref: City)								
Suburb	.718	0.339-1.524	0.779	0.395-1.539	0.585	0.263-1.300	0.678	0.326-1.408
Rural	0.893	0.329-2.421	0.575	0.229-1.443	.791	0.278-2.248	0.544	0.210-1.463

Region (Ref: Northeast)								
Midwest	1.048	0.364-3.024	1.735	0.658-4.579	0.976	0.331-2.883	1.684	0.624-4.544
South	1.008	0.413-2.461	1.398	0.621-3.149	1.127	0.447-2.848	1.482	0.632-3.473
West	1.722	0.628-4.720	1.731	0.684-4.380	1.697	0.594-4.846	1.613	0.611-4.259
Adverse Childhood Experiences	1.231†	0.978-1.551	1.221†	0.990-1.507	1.224†	0.963-1.556	1.196	0.957-1.494
Household Dysfunction	0.946	0.656-1.364	0.918	0.656-1.286	0.978	0.660-1.449	0.923	0.642-1.325
Welfare	0.534	0.212-1.347	1.267	0.579-2.770	0.494	0.190-1.282	1.190	0.524-2.701
Discrimination	1.273	0.508-3.192	1.394	0.611-3.180	1.281	0.484-3.384	1.360	0.570-3.247
Alcoholic Parents	5.208***	2.148-12.624	3.241**	1.422-7.389	5.217***	2.092-13.008	3.155**	1.346-7.397
Language Preference					0.929†	0.854-1.010	0.925*	0.858-0.996
Social Preference					0.941	0.845-1.048	0.868**	0.785-0.961
Ethnic Identification					0.997	0.940-1.057	0.992	0.094-1.047
Social Support					0.987	0.926-1.053	1.021	0.960-1.086
Close Social Ties					1.031	0.974-1.091	0.990	0.940-1.042
Instrumental Social Ties					0.956	0.897-1.120	0.979	0.926-1.034
Log Likelihood	-351.918				-340.490			
Degrees of Freedom	21				27			
Change in χ^2	27.74**/ 5 df				21.55* / 6 df			

Source: Wave 2 NESARC

Notes: Significance compared to Lifetime Abstainers, p<.10†, p<.05*, p<.01**, and p<.001***.

APPENDIX B: Negative Binomial Regression Results: The Average Quantity of Coolers Usually Consumed on Days Respondent Drank Coolers (N=285)

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Male	-0.275	0.243	-0.424†	0.245	-0.467†	0.249
Age	-0.048***	0.011	-0.045***	0.010	-0.045***	0.010
Coupled	0.137	0.258	0.211	0.257	0.152	0.263
Education (Ref: < Hs)						
High School	0.259	0.466	0.303	0.469	0.176	0.483
Some College	-0.025	0.450	0.120	0.447	-0.072	0.457
College Degree	0.520	0.518	0.673	0.527	0.618	0.543
Health Insurance	0.528†	0.317	0.390	0.311	0.395	0.322
Income (Ref: Low-<25,000k)						
Mid (27,500k-55,000k)	-0.107	0.331	-0.106	0.323	-0.090	0.325
High (55,001k +)	-0.420	0.407	-0.540	0.398	-0.504	0.402
Employed	-0.264	0.315	-0.240	0.309	-0.251	0.308
Children under 18 in Home	0.004	0.261	0.216	0.263	0.205	0.269
Community Type (Ref: City)						
Suburb	0.105	0.265	0.039	0.261	-0.001	0.266
Rural	-0.211	0.395	-0.337	0.387	-0.393	0.394
Region (Ref: Northeast)						
Midwest	-0.321	0.377	-0.574	0.385	-0.572	0.388
South	-0.059	0.312	-0.116	0.304	-0.141	0.309
West	-1.489***	0.442	-1.532***	0.443	-1.586***	0.447
Adverse Childhood Experiences			-0.131	0.085	-0.140	0.087
Household Dysfunction			0.012	0.117	0.003	0.118
Welfare			-0.674*	0.083	-0.657*	0.282
Discrimination			0.083	0.272	0.106	0.282
Alcoholic Parents			0.711**	0.262	0.761**	0.272
Language Preference					-0.052	0.048
Social Preference					-0.011	0.041
Ethnic Identification					0.012	0.019
Social Support					0.003	0.026
Close Social Ties					-0.014	0.022
Instrumental Social Ties					-0.008	0.022
LN ALPHA	0.212	0.322	-0.020	0.367	-0.067	0.378
ALPHA	1.236	0.398	0.981	0.360	0.935	0.353
Log Likelihood	-236.109		-230.277		-229.169	
Degrees of Freedom	16		21		27	
Change in χ^2			11.37* / 5 df		2.13 / 6 df	

Source: Wave 2 NESARC

Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.

APPENDIX C: Negative Binomial Regression Results: The Average Quantity of Wine Usually Consumed on Days Respondent Drank Wine (N=285)

	Model 1 Sociodemographic		Model 2 Stressors		Model 3 Coping	
	Coef.	Ste.	Coef.	Ste.	Coef.	Ste.
Male	-0.044	0.153	-0.079	0.153	-0.108	0.155
Age	0.003	0.006	0.003	0.006	0.003	0.006
Coupled	0.002	0.170	0.004	0.171	-0.022	0.173
Education (Ref: < Hs)						
High School	0.659	0.430	0.696	0.433	0.669	0.441
Some College	1.158**	0.410	1.148**	0.416	1.103**	0.424
College Degree	1.472***	0.428	1.494***	0.434	1.485***	0.446
Insurance	0.125	0.207	0.098	0.208	0.133	0.214
Income (Ref: Low-<25,000k)						
Mid (27,500k-55,000k)	0.022	0.228	0.060	0.230	0.109	0.232
High (55,001k +)	0.199	0.256	0.190	0.256	0.253	0.259
Employed	-0.075	0.201	-0.097	0.204	-0.102	0.203
Children under 18 in Home	-0.116	0.177	-0.047	0.181	-0.008	0.186
Community Type (Ref: City)						
Suburb	0.088	0.174	0.096	0.173	0.064	0.176
Rural	0.225	0.240	0.183	0.240	0.141	0.243
Region (Ref: Northeast)						
Midwest	-0.117	0.238	-0.192	0.242	-0.215	0.243
South	-0.093	0.206	-0.110	0.207	-0.115	0.207
West	-0.536*	0.251	-0.590*	0.257	-0.633*	0.259
Adverse Childhood Experiences			-0.072	0.054	-0.086	0.056
Household Dysfunction			0.006	0.075	0.013	0.076
Welfare			-0.230	0.218	-0.233	0.217
Discrimination			-0.075	0.185	-0.082	0.190
Alcoholic Parents			0.237	0.174	0.234	0.176
Language Preference					-0.018	0.042
Social Preference					-0.005	0.026
Ethnic Identification					-0.006	0.013
Social Support					-0.019	0.017
Close Social Ties					0.004	0.014
Instrumental Social Ties					-0.008	0.013
LN ALPHA	-2.446	1.490	-2.693	1.842	-2.982	2.412
ALPHA	0.087	0.129	0.068	0.125	0.051	0.122
Log Likelihood	-295.945		-293.874		-292.580	
Degrees of Freedom	16		21		27	
Change in χ^2			4.08/ 5 df		2.63/ 6 df	

Source: Wave 2 NESARC

Notes: Significance levels p<.10†, p<.05*, p<.01**, and p<.001***.