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ABSTRACT

SUICIDE IDEATION AMONGST ADOLESCENT AMERICAN INDIANS IN A LONGITUDINAL  
CONTEXT

By

Jerreed Dean Ivanich

August 2015

Committee Chair: Dr. Brent Teasdale

Major Department: Criminal Justice and Criminology

The objective of this study is to compare suicidal thoughts amongst American Indian/Alaskan Native's (AI/AN) to a non-AI/AN comparison group, using data from the National Longitudinal Study of Adolescent Health, a nationally-representative, longitudinal study. At wave one a statistical difference is present between AI/AN and comparisons, but at wave four the difference is no longer significant. Using Agnew's General Strain theory as a theoretical framework, factors that may contribute to these differences addressed in this study include: alcohol abuse, exposure to suicidal behavior of friends and family, depression, and weapon access. Implications for prevention and treatment are discussed.

SUICIDE IDEATION AMONGST ADOLESCENT AMERICAN INDIANS IN A LONGITUDINAL  
CONTEXT  
BY

Jerreed Dean Ivanich

A Thesis Submitted in Partial Fulfillment  
of the Requirements for the Degree  
of  
Master of Science  
in the  
Andrew Young School of Policy Studies  
of  
Georgia State University

GEORGIA STATE UNIVERSITY  
2015

## ACCEPTANCE

This thesis was prepared under the direction of the candidate's Thesis Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Master of Science in Criminal Justice in the Andrew Young School of Policy Studies of Georgia State University.

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Andrew Young School of Policy Studies  
Georgia State University  
August, 2015

## DEDICATION

I would like to take this opportunity to thank those that have supported me in my educational pursuits. Specifically, my wife has helped me find my motivation, determination, and overall love for education. It is with her support that I have become the man I am today. Not only has she supported me, but also she has provided and supports our two beautiful daughters. It is their smiles and growth that fill me with unmeasured joy and desire to be a better man and father. It is my hope that they understand how instrumental they are in motivating my educational and professional goals. Lastly, I would like to express my thanks and love for my father Richard Anthony Ivanich. Although he is gone, he will never be forgotten. The lessons I learned from him will forever live on in my work and his grandchildren.

## ACKNOWLEDGMENTS

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## **Chapter I. Introduction**

Suicide claims the lives of thousands of individuals every year, but American Indian and Alaskan Natives see their people affected by suicide more than any other racial group. The most recent reports by the Center for Disease Control and Prevention (CDC) indicate that in 2012 and 2013, the national suicide rate stayed the same at 12.6 suicides per 100,000 people (Kochanek et al., 2014). However, for American Indians the rates were much higher than this national average at 15.6. Suicide has remained in the top ten leading causes of death for the last several decades, understanding the phenomenon for American Indians and Alaskan Natives using a more holistic approach is needed. While a majority of the discussion appears to focus solely on the event of a completed suicide, the bulk of this information is intended to inform the reader of the overarching suicide problem, as a foundation for understanding the main focus of this thesis- suicidal ideation<sup>1</sup>.

The threat suicide poses is far more concerning for American Indians and Alaskan Native people than for any other racial group. Although, Caucasians accounted for nearly 90% of all suicides in 2011 (McIntosh & Drapeau, 2012), American Indian/Alaskan Natives (AI/AN) had the highest rate of suicide in the United States (Wexler et al., 2012). The death rate from suicide for Native Americans was 38.5 per 100,000 people between the years 1999-2004. Researchers must understand the special circumstances of AI/AN lives to have a better understanding of why suicide disproportionately affects these people. To accomplish this, the psychosocial development of American Indian and Native American

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<sup>1</sup> Sandin and colleagues explore the definitions and the details of the suicide continuum; for a detailed review of suicide as a continuum please review (1998).

people must be examined for a better understanding of the underpinnings that put them at the highest risk for suicidal behavior.

The data show that American Indians and Alaskan Natives are at the highest risk for suicidal behavior (see Table 1. And Table 2.<sup>2</sup>). Freedenthal & Stiffman (2004) suggest that adolescent AI/AN are at increased chance of suicide, however, this pattern is atypical of the national trend of suicidal behavior. As one can see in Table 1 and Table 2, suicide increases with age amongst all racial groups, but remains highest among the AI/AN populations. Suicide typically becomes a heightened risk factor, as individuals grow older<sup>3</sup>. Scholars are exploring the risk of adolescent suicide (see, Borowsky et al., 1999; Fried et al., 2013; Grossman et al., 1999, Hart et al., 2013), but few, if any, have explored the mechanisms that may be contributing to the increased suicidal behavior of American Indian and Alaskan Native adolescents.

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<sup>2</sup> Tables 1 and 2 data collected from WISQARS (see [www.cdc.gov/injury/wisqars/](http://www.cdc.gov/injury/wisqars/)).

<sup>3</sup> It is estimated that every 96 minutes there is one elderly (65 and older) death by suicide in the United States ([www.cdc.gov/ncipc/wisqars/default.html](http://www.cdc.gov/ncipc/wisqars/default.html)).

Table1.  
2013 Suicide rates of 13 year olds.

Race	Age	Year	Sex	Number of deaths	Population	Rate per 100,000
White	13	2013	Male	57	1,643,454	3.47
			Female	37	1,560,552	2.37
			<b>Total</b>	<b>94</b>	<b>3,204,006</b>	<b>2.93</b>
Black	13	2013	Male	13	356,549	3.65
			Female	5	343,811	1.45
			<b>Total</b>	<b>18</b>	<b>700,360</b>	<b>2.57</b>
AI/AN	13	2013	Male	2	38,973	5.13
			Female	1	37,587	2.66
			<b>Total</b>	<b>3</b>	<b>76,560</b>	<b>3.92</b>

Table 2.  
2013 Suicide of 28 year olds.

Race	Age	Year	Sex	Number of deaths	Population	Rate per 100,000
White	28	2013	Male	443	1,712,669	25.87
			Female	105	1,628,655	6.45
			<b>Total</b>	<b>548</b>	<b>3,341,324</b>	<b>16.40</b>
Black	28	2013	Male	56	307,689	18.2
			Female	12	324,756	3.7
			<b>Total</b>	<b>68</b>	<b>632,445</b>	<b>10.75</b>
AI/AN	28	2013	Male	12	36,313	33.05
			Female	2	33,447	5.98
			<b>Total</b>	<b>14</b>	<b>69,760</b>	<b>20.10</b>

General Strain theory will be utilized as the theoretical framework for understanding suicide in this study for several reasons. Generally stated, general strain theory posits that negative life events will lead to negative emotional responses, followed by individual level coping to deal with the negative emotions developed from negative life events. It has been argued that AI/AN populations are susceptible to higher levels of strain than their counterparts, in the earlier years of adolescence (Eitle & Eitle, 2013); therefore, they may be at higher risk for suicidal ideation. The strains measured in this study put individuals on trajectories for increased suicidal behavior (e.g., adolescent alcohol use, depression, access to weapons, and exposure to suicide). While suicidal thoughts may increase as American Indians and Alaskan Natives get older, they may begin to look more like other racial groups. Meaning, that they do not think about suicide less than they did in adolescent years, but that their patterns in which they think about suicide as adults is similar amongst other racial groups as well. The data used will allow for a review of all of the above-mentioned predictors in adolescence and again in early adulthood for a deeper understanding of the changes of strains and coping of AI/AN people, over time.

The purpose of this study is to examine the factors that are commonly associated with AI/AN populations for suicide ideation, using a longitudinal research design. Four major concepts- Alcohol/substance abuse, depression, access to weapons, and exposure to family/friend suicide - will be explored to assess their predictive value for suicidal thoughts of AI/AN individuals in wave I of The National Longitudinal Study of Adolescent to Adult Health data. Additionally, a follow up analysis of wave IV data will be conducted to review whether the mechanisms that contribute to differential suicidal thoughts in adolescence maintain in adult years. The primary goal of this study is to advance our understanding of

the individual mechanisms that put AI/AN at larger risk for suicidal thoughts in adolescent years and what changes occur overtime in those relationships. Alcohol abuse/use is often a correlate of suicide, but it has also been found that alcohol use is more of a problem for American Indians and Alaskan Natives (Barnes et al., 2002). The second predictor that will be reviewed for this study is depression. Depression is arguably the most robust correlate of suicide, but may have a particularly vital role for AI/AN individuals. The third predictor that will be discussed is the unique subsistence lifestyle of American Indians and Alaskan Natives live that subsequently allows for adolescents to have more access to lethal weapons in the home. Lastly, exposure to family and friends that have attempted and even completed suicide as a strong correlate of suicide is debated among suicide scholars, but I believe is an important factor to consider for American Indian and Alaskan Natives, as it has never been examined for this group of people.

The contributing factors that put adolescent AI/ANs at higher risk for suicide have seen little empirical study. The purpose of this study is to explore the mechanisms that contribute to the heightened risk of suicidal tendencies of adolescent AI/ANs, in the United States. Three gaps in the previous empirical work that has explored AI/AN suicide will be addressed in this study. First, the majority of the research that has been conducted on AI/AN suicide has primarily used data collected in rural areas and reservations. Data used for this study will use information from respondents that self-identify as American Indian or Alaskan Native, but do not go to school on reservations. Second, previous studies have not been able to make direct comparisons to non-AI/AN individual's using the same data. In the current study, I will be able to compare AI/AN individual's directly to other race groups in the same data set. Lastly, little to no longitudinal data has been collected from

AI/AN adolescents as they progress into adulthood. The use of The National Longitudinal Study of Adolescent to Adult Health data will allow for an empirical examination of AI/AN individuals over time, as they progress into adulthood.

## **Chapter II.**

### **Literature Review**

#### Strain Theory

General strain theory (Agnew, 1992) is one of the more empirically-studied theories in criminology, and it shares similarities to Pearlin and colleagues' theoretical work (1981) related to stress processes. In many ways, the heart of what Agnew and Pearlin et al., are discussing in their theoretical frameworks is the ways in which stress as a larger concept can be broken down and interpreted to explain negative reactions such as deviant behavior and negative mental health outcomes. Research is growing on the unique impact that stress may play in AI/AN populations (Nock et al., 2008). Stress is argued to be a mechanism that sparks other activities that then lead to suicide, such as alcohol use, depression, and PTSD for AI/ANs (Kraus & Buffler, 1979; Waldrop et al., 2007).

Agnew's general strain theory (now referred to as GST) states that strain is present in any of three conditions: 1) one is prevented from achieving positively valued goals, 2) one has positively valued stimuli removed or threatened to be removed from their possession, and 3) one is presented with or threatened to encounter a negative or noxious stimulus (1992, p. 50). When one or multiple strains are present in one's life, it has the potential to produce negative feelings such as anger, anxiety, frustration, and depression. Agnew argues, however, that while strain may be present and may produce negative emotions, coping mechanisms may help manage strain.

Stress is an omnipresent conceptual factor of GST that is discussed in forms of negative emotions, and stress is also discussed as a primary component that is negatively valued leading to different methods of coping. It is important to note then that the

American Psychological Association reported in the year 2013 that forty-two percent of adults have reported their stress levels are higher than what they believe to be a healthy amount of stress (2014). Stress has been found to contribute to poorer health practices, increased disease risk, mental health disorders, and suicide (Cohen et al., 2007; Luscomb et al., 1980; Pearlin, 1999). Specifically related to suicide and the stress process, studies have shown that stress process to be an effective tool in determining suicide predictors. A study of 522 individuals from Canberra, Australia found that “mastery”, a major concept discussed by Pearlin and colleagues (1981) related to one’s self perception of “being in control”, decreased male odds of attempting suicide (Fairweather, Rodgers & Butterworth, 2006).

In addition to work that has reviewed Pearlin et al. (1981), the suicide literature has also used GST to understand suicide. Stack and Wasserman (2007) studied traditional strain concepts and also included economic strains in their review of suicide and found that in 43 of the 62 cases were categorized as being under strain at time of suicide. Further evidence of GST and suicide are found in Zhang & Lester’s (2008) study, in which they find that virtually all of their cases observed (39/40) showed signs of strain characteristics preceding suicide. Combined, the work of Agnew and Pearlin create a backdrop for understanding what predicative factors should be considered in this current study. The following sections will discuss in more detail the predicative factors commonly associated with suicide and suicidal ideation, and will also continue to explore their connection to GST as well.

### Predictors of Suicide



The study of suicidal behavior has been of scholarly pursuit for hundreds of years (Goldney et al. 2008). For the first time, this study will apply GST to suicide for American Indian and Alaskan Native populations. A GST framework would include several factors that would stem from the three major concepts of GST: 1) one is prevented from achieving positively valued goals, 2) one has positively valued stimuli removed or threatened to be removed from their possession, and 3) one is presented with or threatened to encounter a negative or noxious stimulus. A control measure for socioeconomic status will be included in the study to cover the concept of GST's prevention of achieving positively valued goals. Exposure to a friend or family member that has attempted or completed suicide will operationalize GST's concept of removal or threat of removal of a positively valued stimuli. Alcohol will also be included in this study as a measure for GST's negative coping mechanism. Lastly, depression will account GST's negative emotional response to strain. The last major topic reviewed in this study will be a discussion of the impact having access to weapons has on suicidal behavior. Beyond discussing these predictive factors, brief insight will be given to other notable indicators for suicide risk behaviors, namely age, and gender.

#### *Depression*

GST states that the strains produce negative emotions including, but not limited to: depression, disappointment, and fear (Agnew, 1992). In a similar vein as GST depression is major consideration in Pearlin and colleagues Stress Process (1981). In both cases, depressive symptomatology is linked to stresses or strains in life and negative coping or negative acting out. Therefore depression plays a vital role in the strain literature, stress process literature, and the suicide literature.

Depression is a strong and robust correlate of suicidal behavior (Apter et al., 1993; Beskow, 1990; Van Praag & Plutchik, 1984). Lasgaard and colleagues (2011) were among the first scholars to review loneliness, depressive symptoms, and suicide ideation in adolescence using a longitudinal research design. Their results indicated that when controlling for depression, loneliness was no longer statistically significant, but that depressive symptoms are the driving variable contributing to suicide ideation overtime. Praag and Plutchik (1984) found that severity of depression may have an effect on suicide type. While depression is a strong predictor of suicidal behavior, it may also be disproportionately concentrated amongst the racial groups most at risk for suicide.

Indeed, the AI/AN populations<sup>4</sup> may be more at risk for depression than other racial groups. The AI/AN populations are diverse and widespread, making the rate of their depressed populations difficult to measure. Clinicians have faced a troublesome task of finding and diagnosing depression in many of the 510 federally recognized tribes due to their locations, isolation, and cross-cultural differences (Whitbeck et al., 2002). Preliminary studies suggest, however, that the AI/AN populations are at four to six times the risk of the U.S. population for depression (Manson et al., 1985). The prevailing difficulties within this special AI/AN population only allow for rough estimates of the population's rate of

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<sup>4</sup> It is important to note that a large portion of the available literature of AI/AN populations has dealt with these populations primarily on the reservation and in rural areas in close proximity to reservations. A dichotomy is created between the work on the reservations and the work of AI/AN populations off the reservations which may call into question the use of prior literature as support for the current study. However, it is argued here that AI/AN population are a historically underrepresented minority that encounter racial discrimination and social inequality that continue to negatively impact their lives even when the structural level disadvantages are not present off the reservation. In essence, this study, being one of the first to explore adolescent AI/AN population suicide off the reservation will explore many of the same factors often associated with reservation life for exploratory purposes to see if they still apply to non-reservation AI/AN populations.

diagnosis. More work to better diagnose this special population is needed to advance our understanding of depression amongst AI/AN groups.

Depression is not only a strong indicator of suicide risk for the general population, but is also valuable in understanding AI/AN suicide risk behavior. In a study of Native American women, half of the study population indicated a history of depression, and, of the half with a history of depression, one-third had attempted suicide at some point in their life (Bohn, 2003). Depression amongst the AI/AN population may, on the surface, seem to be of similar value to the general population study of suicide risk factors; however, Olson and Wahab (2006) have pointed out the unique circumstances of the AI/AN population. Olsen and Wahab (2006) suggest that the heightened risk behaviors of alcohol use/abuse and lack of support groups may exacerbate the impact that depressive symptoms have on the AI/AN population. The impacts of comorbidity of depressive symptoms, suicidal behavior, and alcohol/ substance abuse are discussed by Dinges and Duong Tran (1993, P. 494-495), “Thus it is common to find the potentially far more lethal comorbidity of depression with current suicidal ideation or recent suicidal attempt (27.3), along with substance abuse or dependence (31.1%), which together account for 58.4% of cases.” Depression is a consistent and strong correlate of suicide risk behavior; however, as shown above factors such as alcohol use and substance abuse must also be taken into account in understanding suicide outcomes.

#### *Exposure to Suicide*

Scholars contend that previous exposure to suicide is an important predictor of suicidal behavior (Burke et al., 2010; Crosby & Sacks, 1994; Hazell et al., 1993). GST and Pearlin et al.'s (1981) stress process would also contend that previous exposure to suicide

is a major life event that has large potential to impact one's strain level and thus leave one more vulnerable to negative coping or acting out. Specifically, exposure to family or friends that have attempted or completed suicide may increase one's suicidality (Agnew, 1992; Pearlin et al., 1981). To substantiate the claim that previous exposure increases the likelihood of suicidal behavior, Crosby and Sacks (1994) found that an estimated 5.4% of the United States' population report exposure to friend or acquaintance's suicide and 1.1% of the United States' population report exposure to suicide of a relative. Furthermore, they go on to explain that, respondents who were exposed in some way to suicide of another person in the 12 months prior to the survey were more likely to have thought about suicide (OR +1.6,  $p < 0.01$ ), and were also more likely to have made a suicide attempt (OR = 3.7,  $p < 0.01$ ) than those that were not exposed to suicide (Crosby et al., 1994, P. 323). Additionally, offspring of suicide completers and suicide attempters are four times more likely to report lifetime suicide attempts compared to unexposed individuals (Burke et al., 2010).

Contrary to scholars that have found support for the correlation of previous exposure to suicide and one's own suicidal behavior, Brent and colleagues (1996) deny claims that previous exposure to suicide of a friend or family member may enhance one's risk for suicide in the future. Brent and colleagues (1996) data may be inherently biased. All respondents agreed to take the survey after a family member completed a suicide. Individuals agreeing to take surveys that would require respondents to relive the experience of their loss may be an indication of some form of an increased ability to cope with exposure to suicide, compared to those that denied participation. Brent and colleagues collected data from 67% of eligible families that recently had a family member commit suicide. This figure would be consistent with the number of individuals that Miles and Demi

(1991) found do not harbor feelings of guilt for the loss of their close one. Therefore, it is possible that the respondents that participated in this study were systematically different than the rest of the population that the results would be skewed towards the indication that exposure to suicide does not affect family and friends.

Mercy and colleagues (2001) make similar arguments that exposure to suicidal behavior is not an influential factor in someone else's suicidal behavior. Mercy and colleagues interviewed 153 victims of nearly lethal attempts in a Houston, Texas emergency room. Results of their research did not support claims that exposure to suicide can affect others suicidal behavior, but the researchers data only reviewed individuals that had attempted suicide, which is not as stressful and impactful as losing a friend or loved one to suicide. While the results are mixed, it is argued that increased risk of suicidal behavior or suicidal thought because of previous exposure may affect some groups more so than others due to social and environmental differences (Hazell et al., 1993; Stack & Wasserman, 2005).

AI/AN populations are at a heightened risk of suicide (Bohn, 2003; Borosky et al., 1999; Olson & Stephanie, 2006; Wexler et al., 2012). Further consideration is now given to how this heightened exposure to suicidal behavior within the AI/AN population may be influencing other AI/AN individuals. Support for the claim that previous exposure to a suicide increases the likelihood of the exposed individual thinking, attempting, and completing suicide extends to AI/AN populations (Bechtold, 1988; Borowsky et al., 1999; Grossman et al., 1991). In a review of the 1988 Navajo Adolescent Health Survey, a subset of the Indian Health Service Adolescent health Survey, showed that several variables were strongly associated with suicidal risk behavior. Specifically, family history of

attempt/completion (OR = 2.3) and friend history of attempt (OR = 2.8) were statistically significant predictors (Grossman et al., 1991).

AI/AN populations are not restricted to living only on the reservation; in fact, a large portion (88%) do not live on the reservations (U.S. Census, 2010). For this reason, Freedenthal and Stiffman (2004) review suicidal differences between urban/non-reservation American Indians and those that lived on the reservations. In this comprehensive comparison between the two groups, several factors affect both Urban/non-reservation and reservation living American Indian populations. A major similarity between both groups is that exposure to friend and family suicidal behavior was a significant predictor of suicide attempts (Freedenthal & Stiffman, 2004).

#### *Alcohol*

Agnew's GST discusses alcohol use in terms of coping. In fact, GST accounts for three types of coping strategies: cognitive coping, behavioral coping, and emotional coping strategies. Emotional coping strategies are when individuals attempt to cope with their negative emotions that are the result of their adversities through the use of or activities that will distract, alleviate, or subdue the negative emotions present. It is for this reason and to test the common conception that AI/AN people are effected by the use of alcohol more than other groups that it is being considered in this study.

According to a recent Gallup Poll, sixty-four percent of Americans drink alcohol, and these findings are consistent with long-term efforts to track American drinking habits since 1939, by the Gallup Poll. Gallup Poll data suggest that since 1939 American drinking behavior rarely falls below 60%; conversely, American drinking behavior rarely exceeds 67%. Drinking alcohol is not illegal, but often is the catalyst for other dangerous behavior

including violence, victimization, arrest, and suicide (Brenner, 1975; Collines & Messerschmidt, 1993; Pridemore, 2006; Swahn et al., 2008).

Occasional drinking and alcohol abuse are very different events. Alcohol use or occasional drinking has not found a clear definition that alcohol abuse has in the Diagnostic and Statistical Manual of Mental Disorder (DSM). According to the DSM-IV alcohol abuse is:

A maladaptive pattern of drinking, leading to clinically significant impairment or distress, as manifested by at least one of the following occurring within a 12-month period:

- Recurrent use of alcohol resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to alcohol use; alcohol-related absences, suspensions, or expulsions from school; neglect of children or household)
- Recurrent alcohol use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by alcohol use)
- Recurrent alcohol-related legal problems (e.g., arrests for alcohol-related disorderly conduct)
- Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol (e.g., arguments with spouse about consequences of intoxication). (DSM IV P. 199).

To illustrate the differences between use and abuse, 64% of Americans use alcohol, defined as those that have on occasion consumed alcoholic beverages such as liquor, wine, and beer. Additionally, national survey data from 1992 indicate that the rate of alcohol abuse in the

U.S. population 18 years of age or older is only 5.09% for White men, 2.38% for Black men, 1.71% for White women, and 0.73% for Black women (Grant et al., 2004).

The use of alcohol is argued to be a key factor to review when looking for emotional coping strategies of strained adolescents (Agnew, 1992). Alcohol is used by individuals for its ability to alleviate negative emotions as an immediate method to escape or suppress negative emotions. The use of alcohol is a emotional and substance coping mechanism of strain and is of particular interest when studying AI/AN populations. Given the fundamental and widespread notion that AI/AN populations already use alcohol more often than other racial groups (Eitle & Eilte, 2013) and the increased risk of negative behavior alcohol has on adolescent individuals it is of extreme value to this study.

The use and abuse of alcohol and other illicit drugs is associated with suicide behavior in all stages of life (Flensburg-Madsen et al., 2009; Karch et al., 2006; May et al., 2002; Murphy & Wetzel, 1990; Rieckman et al., 2012; Rossow & Amundsen, 1995; Swahn et al., 2008; Tuisku et al., 2014). Alcohol use in preteen years is correlated with suicide attempts later in life, even after controlling for age, gender, race/ethnicity, heavy episodic drinking, other substance use, peer drinking, depression and impulsivity (Swahn et al., 2008). As individuals age out of adolescence and into adulthood, those who abuse alcohol and other substances are suggested to have an 11-15% suicide risk rate (Frabces et al., 1987), but this notion has been challenged in other studies, namely by Rossow and Amundsen's (1995) study of Norwegian conscripts and by Murphy and Wetzel's (1990) review of lifetime risk of suicide by alcoholics. Both studies found that while suicide rates are increased in individuals that abuse alcohol, the rates are much closer to 2-4%, not the originally claimed 11-15% (Murphy & Wetzel, 1990; Rossow & Amundsen, 1995).



Alcohol use has not only been studied in its connection to age and suicide, but also for its role in different cultures and race/ethnic groups. In an attempt to review the differences between racial groups committing suicide, Kerch and colleagues (2006) reviewed 2004 data from the National Violent Death Reporting System. The authors found that at the time of suicide, Hispanics had a 49.2% positive test rate for drugs/alcohol compared to non-Hispanic Blacks at 36.8% positive for drugs/alcohol (Karch et al., 2006). Suicidal behavior may be a raced event and as such, it is vital to then consider AI/AN's increased connection to the use of alcohol.

AI/AN populations have been burdened with a stereotype of being a group of individuals that tend to abuse and use alcohol more often than any other race in America. Although geographical, cultural, and religious differences are vast among AI/AN populations, available data suggests that the use of alcohol by AI/AN populations reaches upward of 87%, compared to the general population use of roughly 67% (May, 1996). Findings also suggest that when drinking that AI/AN populations tend to consume more quantity of alcohol compared with other groups, and also experience higher rates of negative consequences when drinking when compared to non-AI/AN peers (Oetting & Beauvais, 1989). These findings, coupled with the previously mentioned stereotype have sparked an interest in whether these drinking patterns affect AI/AN suicidal behavior (Beauvais, 1998).

AI/AN populations are often considered to be at higher risk for alcohol use than any other group (Bohn, 2003; Dinges & Duong-Tran, 1992; May et al., 2002); findings suggest that alcohol use plays an integral role in suicide behaviors (Chartier & Caetano, 2010). May and colleagues (2002) studied blood alcohol content (BAC) levels at time of suicide among

three tribes Apache, Navajo, and Pueblo. Results of their studies indicate that all three tribes showed individuals having a BAC greater than 0.1 at time of suicide. Additionally, they found that not only was alcohol often present in these three groups at the time of suicide, but that the BAC levels were more than double (mean BAC = 0.198) that of the legal limit of 0.08 in New Mexico (May et al., 2002). In Alaska, Alaskan Native populations have been noted to be at a much higher risk of alcohol use at time of suicide compared to non-Alaskan Native populations (79% vs. 48%) (Hlady & Middaugh, 1988). Studies are consistently finding that alcohol use is playing a large role in suicidal behavior of AI/AN's (Bohn, 2003; Dinges & Duong-Tran, 1992; May et al., 2002); however, little empirical data is available to truly understand the full effects alcohol may be having in the long term. Although some risk behaviors center on the self, such as alcohol or drug use, other risk factors focus on the social environment that cannot be controlled, such as exposure to suicide by others.

#### *Access to weapons*

Access to weapons, particularly guns, has decreased in the past several decades. According to a recent article in the New York Times, the past four decades have seen consistent decreases in the ownership of guns (Tavernise & Gebeloff, 2013).

The household gun ownership rate has fallen from an average of 50 percent in the 1970s to 49 percent in the 1980s, 43 percent in the 1990s and 35 percent in the 2000s, according to the survey data<sup>5</sup>, analyzed by The New York Times. (March 9, 2013, P. 1).

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<sup>5</sup> General Social Survey data that is collected every two years and asks respondents if they have a gun in the home, and subsequent questions ask about the type of gun in the home.

Several scholars have found similar rates of gun ownership (Davis & Smith, 1998; Kaplan & Geling, 1998; Siegel et al., 2013; Wright, 2006). National rates provide insight to the holistic context of gun ownership, but region and specific sub-groups of the nation may provide powerful insights into which subgroups may be most likely to use weapons as a method of completing suicide.

AI/AN gun usage and gun laws are unique from the rest of the country. AI/AN populations are distinct from the majority of other American gun owners for two major reasons. First, AI/AN groups have a rich history of subsistence living (Brown, 1982). Specifically, many AI/AN individuals still rely heavily on their ability to fish and hunt to feed themselves. Second, many AI/AN groups do not operate under the same jurisdictional boundaries that others live in and are often sovereign nations (Riley, 2011). The ability to create and maintain laws within their own boundaries allows for different interpretation of the law than the majority of American citizens. The combination of these two distinctions from other Americans would create an environment that may lead to more access to weapons, specifically guns (Wexler et al., 2012). Furthermore, it can be argued that because of two points made above that AI/AN individual's not living on reservations will still have increased access to guns because of heritage, tradition and culture.

Little is known of the rates of gun ownership of AI/AN populations as they are often secluded from being participants of survey research and do not have to follow the same reporting as other American citizens do. However, a study of Anchorage, Alaska and Matanuska-Susitna Borough found that in the more rural area of Mat-Su Borough that minorities including Alaskan Natives were more likely to report gun ownership than Whites in the same area (Chamard, 2010). A large body of literature has focused on the

access to weapons in school survey data, but have come short of having detailed descriptive statistics on AI/AN populations as a whole (Borowsky et al., 1999; Hlady & Middaugh, 1988; Mullany et al., 2009).

The research that has been conducted indicates that access to weapons is a strong correlate of suicide (Kellermann et al., 1992). In a study of two separate counties (King County, Washington and Shelby County, Tennessee) researchers found that over half of the suicides committed over a 32 month period used firearms as the primary method of completion (Kellermann et al., 1992). Kaplan and Geling (1998) found in a comparison of nine regional areas of the United States that in regions that household gun ownership was high, suicide by firearm was more likely; even more so than homicide. Additionally, others have reviewed gun ownership by dividing the United States into large regions and also by already existing geographical divisions of the 50 states. Researchers have found that in regions and states where gun ownership is high, so too are suicide rates (Miller et al., 2002). Access to weapons is such a robust correlate of suicidal behavior; it has led scholars to study this association across racial groups, including AI/AN populations.

The use of and access to guns has been suggested to play a heightened role in suicide by AI/AN populations (Wexler et al., 2012). In a nationally representative study of adolescents, it was found that AI/AN were more than twice as likely (14.4 vs. 6.0) to carry a weapon at school than their White counterparts (Rutman et al., 2008). A study reviewing Apache, Navajo, and Pueblo American Indians found that in all three groups the rate of suicide by firearm was higher than the national average (Approximately 54%). Findings indicated that Pueblos were at highest risk for suicide by firearm, Pueblo males used firearms in 80.8% of recorded suicides and females used firearms 50% of the time in

recorded suicides (Winkle & May, 1986). Combined and at each tribal level, males were seen to have the highest risk of suicide by firearm, with the exception of Apache females. Apache females that committed suicide used firearms 66.7% of the time, and male Apaches used firearms 63.0% of the time. These findings are inconsistent with findings of Borowsky et al. (1999) that found that females in the 1990 National American Indian Adolescent Health Survey had an increased risk of suicide when they knew where to find a gun. Research is clear that access to weapons does put AI/AN populations at a heightened risk of suicide.

### *Age*

Age differences play a large role in suicide behaviors (see Conwell et al., 1990; Neeleman et al., 1997; Fernquist & Cutright, 1998; Preti & Miotto, 1998; Vanrnik et al., 1998; McGirr et al., 2008). General findings have indicated the risk for suicidal behavior is at its peak from adolescence into middle-aged adulthood. The event of suicide prior to the time an individual reaches the age of 10 years old is a relatively rare phenomenon, one which is not seen in many studies; however, the rate increases in the age bracket of 10-14 and even more so in individuals 15-19 (Ung, 2003).

Age differences among AI/AN groups may also have a unique influence on suicide. AI/AN aged 15-24 years are often seen to have suicide rates twice as high as U.S. general population for the same age (Goldsmith et al., 2002). The Wind River Reservation kept records of suicide attempts and completions from 1970 until 1985. A review of the records for the months of August through September in 1985 show that nearly half (40 of 88) of the confirmed suicide attempts derived from individuals aged 13-19 (Tower, 1989). The importance of understanding one's age in connection to suicide gives a good overview and

context of suicidal behavior, but does little to explain what causes suicidal behaviors as suicide may be an aged or gendered experience.

### *Sex*

Males are often reported as having higher suicide completion rates than their female counterparts (Canetto, 1991; Canetto, 1992; Girard, 1993; Lindeman et al., 1996; Langhinrichsen-Rohling et al., 1998; Dahlen & Canetto, 2002; Goodyer, 2009; Van Dulmen et al., 2013). For example, in 1992, the male suicide completion rate was 21.9 per 100,000 and for females a rate of 3.7 per 100,000 was observed (Langhinrichsen-Rohling et al., 1998). Conversely, females do not complete suicide as often as their counterpart males, but have been cited to attempt suicide more often than males. Females often do not use the same irreversible means of suicide that males do (Brent et al., 1999). In a study of 16 European countries from 1989-1992, every single country except one indicated that females attempted suicide at a higher rate than males in the same age groups (Schmidtke et al., 1996). Females also were observed to have the highest attempt ration (1: 1.8) to males in the 15-24 age group (Schmidtke et al., 1996). Gendered experiences in suicidal behavior is a consistent pattern in the literature.

As with the general population, suicide is a gendered event for the AI/AN populations as well. Consistent with the extant literature of female suicide, one or more attempts were reported by 21.8% (1323 of 6079) of girls and 11.8% (661 of 5587) of boys in the 1990 National American Indian Adolescent Health Survey (Borowsky et al., 1999). These findings are consistent with the patterns noted in previous studies of the general U.S. population, but what is of important note is that the 1990 National American Indian Adolescent Health survey found that 22% of females attempted compared to the 12% of

girls in the 1995 National School-Based Youth Risk Behavior Survey (a nationally representative school-based survey). Another comparison between these two data collection efforts found 12% of boys attempted suicide in the National American Indian Adolescent Health survey; whereas, only 6% of boys attempted in the National School-Based Youth Risk Behavior Survey. Side by side comparison indicate almost a doubling of suicide attempts between the populations. The pattern of female attempting suicide more often is consistent with extant literature, but the extent to which this pattern manifests in AI/AN populations is of note. Unpacking of these gendered differences may be attributable to how stress is handled.

#### *Socioeconomic Status*

Low socioeconomic status (SES) is often considered a driving factor in social behavior (Chiricos & Waldo, 1975; McLoyd, 1997), physical health of individuals (Blumenthal et al., 2002; Sobal et al., 1989), and mental health of individuals (Williams et al., 1997). According to the United States Census Bureau, in 2013, 45.3 million people lived in poverty (Denavas-Walt & Proctor, 2014). Although these numbers are not statistically different when compared to the preceding year (2012), a longer view indicates that in the year 1974 less than 20 million people lived in poverty, suggesting a continued rise in poverty in the United States for many years. Considering the growth in poverty in the United States and its impact on multiple outcomes, one should consider how SES has manifest in the suicide literature.

Low SES has been found to be associated with suicide. Add Health data has suggested that income is a statistically significant predictor of suicide, even when controlling for other SES indicators (e.g. education, income, occupation) and socio-

demographic factors (Goodman, 1999). Other scholars that have reviewed the role that SES has in suicide have found similar results (Karch et al., 2006; Lewis et al., 1988). Lewis and colleagues (1988) compared 26 adolescent individuals that had attempted suicide to 725 non-attempters within a school based survey. Comparing the youths that attempted and the youths that did not on several factors, including SES, they showed that while SES may not be the strongest correlate of suicide, it was still a positive significant relationship in the models (Lewis et al., 1988).

SES, although a robust and common consideration in the suicide literature, SES is not found in the literature of AI/AN suicide risk factors. It is surprising that little to no research has measured SES as a correlate of suicide for AI/AN populations, because many authors discuss the inherent disadvantages that living on the local reservations or villages have in contributing to higher suicide rates of the AI/AN populations (Bachman, 1992; Freedenthal & Stiffman, 2004). For example, Freedenthal and Stiffman (2004) find that American Indians that live on the reservation have a higher likelihood of reporting lifetime suicidal ideation than their urban counterparts (18% vs. 14% respectively). No studies to date have empirically tested the notion that Urban AI/AN live in higher SES circumstances than their reservation dwelling counterparts, but the limited literature would suggest that the relationship maybe present.

#### Longitudinal Suicide Studies

Differences between racial or ethnic groups over time pinpoint what predictive factors should be considered for an individual's race and stage of life. Using the Add health data, scholars studied leading health indicators over time for different race/ethnic groups (Harris et al., 2006). These scholars found that of the 20 leading health risk factors, 15 of



the risk factors increased over time for all the racial groups. Additionally, they found that for all groups except African Americans and AI/AN's, a decline in perpetrating violent acts takes place (Harris et al., 2006). These findings illustrate the need to understand the life changes by race over time to better understand the predictive factors associated with individuals on a personal level at any given time.

Longitudinal AI/AN suicide studies are not as frequent conducted compared to other racial groups, but one exception is a study of Alaskan Native youth suicide risk behaviors over an 8 year period (Wexler et al., 2012). Results of this work showed several differences between Alaskan Natives and commonly found suicide patterns of the general public. Females are often cited as having a 2-3 times higher risk for attempting suicide, but in Wexler and colleagues study females were only slightly more likely to attempt than male Alaskan Natives. Additionally, resource usage is notably different for Alaskan Natives than what is typically seen in the literature.

Despite the prevalence of alcohol misuse (54.9%), interpersonal abuse (12.5%), signs of depression and stress (31.2%) and grief (25.6%), very few of the suicide decedents sought out or received behavioral health services (18.4%). Considering both attempters and decedents, over half of those receiving mental health treatment discontinued care. This suggests that these services are not only underutilized, but also were not working effectively for many people who needed them. (P. 282)

Continued work is needed in AI/AN suicide literature, especially utilizing longitudinal methods for a better understanding of the similarities and differences between groups for clinical policy development.

The largest concept worth exploring in a longitudinal perspective as it relates to GST and suicide is a review of the coping mechanisms and patterns of AI/AN population's overtime. These coping mechanisms are heavily influenced and are often dependent on critical developmental growths made as AI/AN individual's age out of adolescence. It has been found that AI/AN populations tend to self-medicate with the use of alcohol as a coping mechanism earlier in teenage years (Dinges & Duong-Tran, 1993). Finding the mechanisms that change AI/AN individual's coping mechanisms is essential to avoid a lifelong suicidal ideation.

#### The Current study

AI/AN's are considered to be among the most at risk population for suicide, yet little empirical work has been done to understand why AI/AN individuals are at such a high risk (for exceptions see Bohn, 2003; Dings & Doung-tran, 1992; Freedenthal & Stiffman, 2004; Grossman et al., 1991; Tower, 1989; May et al., 2002; Wexler et al., 2012 ). The current study aims to bridge three major gaps in the literature. First, the majority of the research that has been conducted on AI/AN suicide has primarily used data collected in rural areas and reservations. Research focused primarily on reservation lifestyle is valuable to those that live on reservation, but 88% of AI/ANs do not live on reservations (U.S. Census, 2010). If we do not focus on the 88% of AI/ANs, research may be misunderstanding how suicide impacts AI/AN groups, especially if we are generalizing from data collected from the 22%. The current study will utilize data that is nationally representative of AI/ANs, but the data collection efforts were conducted outside of reservations, thus providing a sample of AI/AN individuals that do not live on reservations or in highly rural areas. Second, previous studies have not been able to make direct comparisons to non-AI/AN individual's using the

same data. In the current study, I will be able to compare AI/AN individual's directly to other race groups in the same data set. Lastly, little to no longitudinal data has been collected from AI/AN adolescents as they progress into adulthood. The use of The National Longitudinal Study of Adolescent to Adult Health data will allow for an empirical review of AI/AN individuals over time as they progress into adulthood. This data will add to the knowledge of trajectories of AI/AN population and will allow for review of what factors may have significant impacts on AI/AN individuals that increase their odds of thinking about suicide, as they age out of adolescence.

A similar problem related to data collected from AI/AN groups is that since a majority of the research being conducted is on reservations, surveys and interviews taken do not capture a comparison group that are not AI/AN. Surveys that fail to collect a sizable sample of non-AI/AN and AI/AN do not allow for comparisons to be made. This applies at the local reservations (May et al., 2002), regional areas (Armstrong et al., 2010), and national level (Borowsky et al., 1999) of research. A lack of ability to directly compare AI/AN individuals to their similarly situated peers prevents us from understanding whether the experiences of the AI/AN population are unique. In order to address this issue, this study will compare a nationally representative sample of AI/AN individuals to similarly situated non-AI/AN individuals, in order to have a better understanding of the suicide risk behaviors that may be more impactful to AI/AN individuals.

It has been rare for AI/AN suicide studies to utilize longitudinal research designs (for exceptions see: LeMaster et al., 2004; May et al., 2002; Van Winkle & May, 1986). The continued use of longitudinal data will benefit our understanding of suicidal patterns over time. Additionally, the use of longitudinal data will aid the understanding of AI/AN suicide

from General Strain Theory perspective. This study will focus on the differences noted between AI/AN and non-AI/AN groups starting with high school and moving forward approximately thirteen years.

As indicated above, the current study will address the gaps found in the American Indian/Alaskan Native (AI/AN) literature. Specifically, I will investigate the effect that alcohol/substance use has on suicide in the AI/AN population. I will also consider depression as a predictor of suicide, along with exposure to a family member or friend that has attempted or completed suicide. Lastly, this study will examine the differential relationship that access to weapons (especially firearms) may have on suicidal ideation for AI/AN people. The figures below give an illustration of the relationship between AI/AN status and suicidal thoughts. Prior studies suggest that being AI/AN has direct and positive impacts on suicidal thoughts. I theorize that alcohol/substance abuse, depression, access to weapons, and previous exposure to family and friends that have committed or attempted suicide are all more likely in the AI/AN population and will all increase the likelihood of suicidal thoughts.

Figure 1 represents the direct relationship hypothesized to be found between race and suicide ideation. Specifically, figure 1 suggests that Whites, Blacks, Hispanics and Others will all be significantly lower in their suicidal thoughts when compared to AI/AN. Figure 2 represents the hypothesized relationships in wave one of the data, when the individuals are in adolescence. AI/AN is hypothesized to have a direct effect on suicidal thoughts. However, the figure indicates that adding alcohol/substance abuse, depression, access to weapons, and previous exposure to family will account for the relationship between AI/AN and suicidal thoughts.

Figure 3 represents the hypothesized relationships in wave four of the Add Health data, when the same individuals are well into adulthood. Figure 3 suggests that race no longer predicts alcohol use and exposure to family and or friends that have attempted or completed suicide, thus they are no longer important mediators for the effect of race on suicidal thoughts. See hypothesis 3 below.

H1: At wave one, other racial groups will have lower suicidal thoughts when compared to AI/AN adolescents.

H2: AI/AN adult suicidal thoughts will no longer be different when compared to the other racial groups, at wave four.

H3: The effect of being AI/AN on suicidal thoughts will be mediated by alcohol/substance abuse, depression, access to weapons, and exposure to family/friend suicide.

H4: At wave four, White, Black, Hispanic, and “other” racial groups will no longer be significantly different in suicidal thoughts compared to AI/AN populations.

*Figure 1*

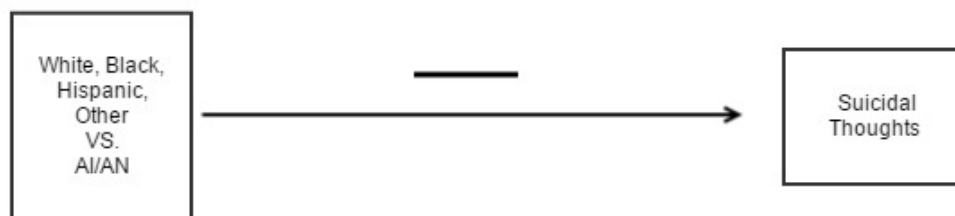


Figure 2

Adolescence

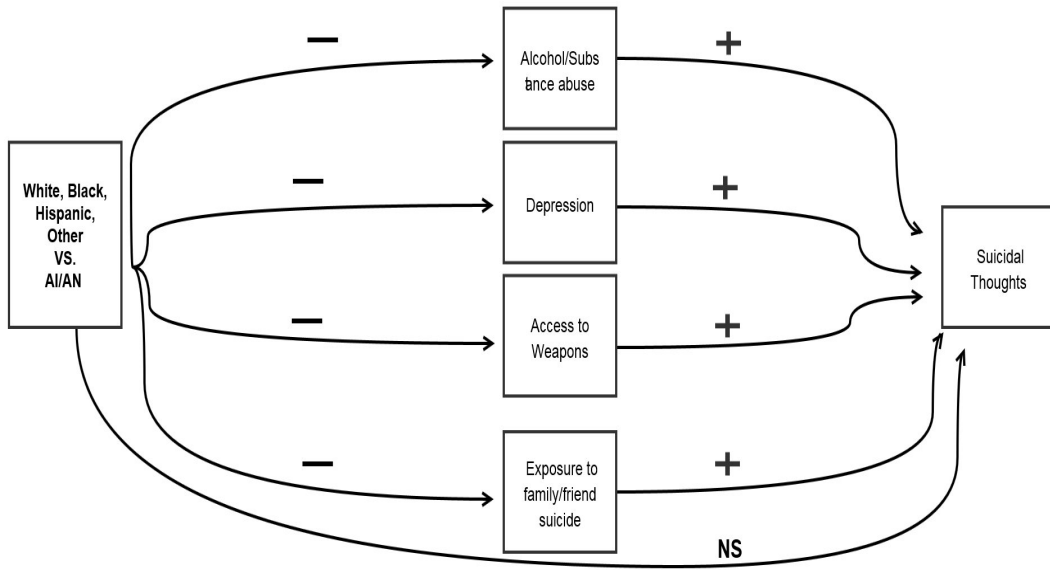
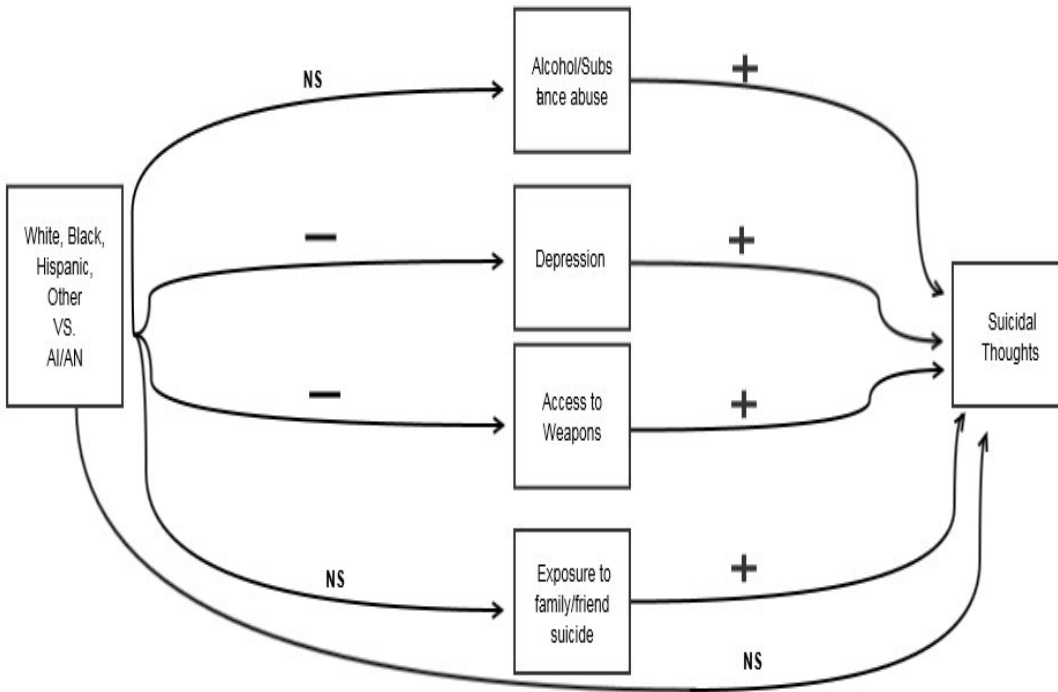


Figure 3

Adulthood.



## **Chapter III.**

### **Methods**

#### ***Data***

Data collected for The National Longitudinal Study of Adolescent to Adult Health were collected in all 50 states of the United States of America, by RTI International through a subcontract from the University of North Carolina at Chapel Hill (Chen & Chantela, 2014). Data collected included information on the respondent's physical state, emotional state, and respondent's prior activities. To collect the sample, researchers used a stratified, random sample of all eligible high schools in the United States. To be considered eligible for the study the school was required to have 11<sup>th</sup> grade students and a minimum of 30 currently enrolled students. In all, 80 clusters of schools were stratified based on region, urbanity, school size, and type of school, demographic makeup, grade span, and curriculum. At wave I of data collection, 90,118 adolescent in-school questionnaires were administered and 20,745 adolescent in-home interviews were conducted. At Wave I the average age of the respondents was just over 16 years old. Wave IV data used for this study, included 15,701<sup>6</sup> adult in-home follow up interviews of the same group of participants from the original data collection efforts. Wave IV interviews were conducted approximately 13-14 years after the initial data collection effort. The majority of Wave IV participants were 24 to 32 years old at the time of the data collection<sup>7</sup>

In-home interviews were conducted at wave I between the months of April and December in 1995. All respondents that participated in the data collection process received

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<sup>6</sup> Response rate of 75.7% from wave I to Wave IV

<sup>7</sup> 52 respondents at Wave IV were 33-34 years of age at the time of the interview, but were included with the rest of the sample.

identical interviews. Interviews lasted approximately two hours. A majority of the interviews were conducted in the respondent's home, but respondents were safeguarded from revealing any sensitive information. Sensitive information was collected through the use of headphones and pre-recorded questions. Respondents replied directly into the laptops used to collect the data.

Wave IV data was collected between the months of January 2008 and February 2009. In-home surveys were administered to the same individuals interviewed in previous data collection efforts at Wave I, Wave II, and Wave III. The collection of data at Wave IV utilized CAPI (computer-assisted personal interviews) and CASI (computer-assisted self-interview). Less sensitive questions were given using the CAPI and the more sensitive information collected was retrieved using the CASI. Interviews lasted 90 minutes for each respondent.

### ***Sample***

At wave I of the data collection, 740 individuals self-identified as being AI/AN. A total of 19,965 individuals did not self-identify their race as American Indian or Native American. Although it may have been possible to include other individuals that selected multiple races, this study excluded them. The intentional exclusion of those that selected multiple races was made to avoid any potential bias in the results. Those that indicate they are multiple races have a higher likelihood of being systematically different than those that identify solely as AI/AN.

Schools chosen for the data collection qualified for the stratified random selection if the school included 11<sup>th</sup> graders and an enrollment of at least 30 students. In-home interviews were conducted in wave I data collection efforts. The in-home sample of 27,000 adolescents was collected. The in-home samples core representative body was a random



sample of individual's grades 7-12 and over samples of select groups. The selected oversample groups include: saturated schools (i.e. all enrolled students of 16 schools were selected for in-home interviews for social network analysis), disabled adolescents, Blacks from well-educated families, Chinese, Cubans, Puerto Ricans, and adolescents residing together (twins, full siblings, half siblings, non-related adolescents, and siblings of twins).

The selection of individuals for inclusion in the in-home sample were done using an unequal probability selection process. The core sample of in-home interviews were selected by stratifying students in each school by their gender and grade then randomly selecting approximately 17 students from each strata from the schools that agreed to participate in the study. The majority of in-home interviews took place in the respondent's place of residence. Depending on the sensitivity of the question, interviewers would administer the questions via laptop or reading question aloud to the respondent. The more sensitive topics respondents listened to a pre-recorded question through headphones and responded directly on the laptop.

## ***Measures***

### ***Dependent variables***

**Suicidal thoughts.** Suicidal thoughts are assessed using the question, "*During the past 12 months, did you ever seriously think about committing suicide?*" The question is asked both at the Wave I data collection and at Wave IV in the exact same wording. Individuals that indicate that YES they have had suicidal thoughts will be coded as a 1 and those that do not will be coded as a 0.

### ***Independent variables***

**Race.** Respondents are asked to self-select their race in the Add health data.

Individuals are given the choice of White, Black or African American, American Indian or Native American, Asian or Pacific Islander, and other. Dummy variables will be created for comparison between Native Americans as the referent group and Whites only. A similar dummy variable will be created to compare Native Americans and Blacks only. Lastly, a dummy variable will be created for a review of Native Americans and all “other” races included in the data, but not specifically identified.

**Alcohol abuse.** An entire section in The National Longitudinal Study of Adolescent to Adult Health is dedicated to questions related to alcohol, tobacco, and drugs. For this study particular attention is given to the questions that focus on more severe signs of alcohol and substance abuse. At wave I respondents are asked, *“Over the past 12 months, on how many days have you gotten drunk or very, very high on alcohol?”* Similarly, Wave IV asks respondents, *“During the past 12 months, on how many days have you been drunk or very high on alcohol?”* The available responses to this question range from most severe “every day or almost every day” to less severe in stages “3 to 5 days a week”, “1 or 2 days a week”, “2 or 3 days a month”, “once a month or less (3-12 time in the past 12 months)”, “1 or 2 days in the past 12 months”, and “never”. To deal with the non-normality of the responses, the variable will be recoded to combine all the individuals that indicated two or more days of drinking in a week as 4 and leaving all other responses as they were. “Never” drinking is coded as a 0, drinking “1 or 2 days in the past 12 months” was coded as a 1, drinking “once a month or less” coded as a 2, drinking “2 or 3 days a month” was coded as a 3.

**Depression.** Depression was evaluated using the feelings scale included in the questionnaires on wave I and at wave IV. At wave I 19 questions were asked to the

respondents about their feelings. Of the 19 originally asked questions at wave I, ten questions are given again in the same exact way. The questions asked at both wave I and at Wave IV are:

1. *You were bothered by things that usually don't bother you.*
2. *You felt that you could not off shake off the blues, even with the help from your family and your friends.*
3. *You felt that you were just as good as other people.\**
4. *You had trouble keeping your mind on what you were doing.*
5. *You felt depressed.*
6. *You felt that you were too tired to do things.*
7. *You were happy.\**
8. *You enjoyed life.\**
9. *You felt sad.*
10. *You felt that people disliked you.*

For each question, the respondents were given the option to answer with the following: "Never or rarely", "Sometimes", "a lot of the time", "most of the time or all of the time", and "don't know". The coding of these responses were as follows, "Never or rarely" was coded as zero, "sometimes" was coded as a one, "A lot of the time" was coded as a two, and "most of the time of all of the time" was coded as a three. Individuals that indicated that they didn't know were treated as missing.

For the current study, several of the variables (denoted by asterisk) will need to be reverse coded to have a uniform and parallel meaning. After recoding, the depression score will be created by averaging the items. Using the newly created depression score a

dichotomous variable was created between those showing signs of depressed scores and those that did not. The cut point used for those that displayed signs of depression compared to the group that did not was 1.4, after the combined and averaged scores were produced. The cutoff point of 1.4 was chosen after reviewing the distribution of depression scores and finding that the distribution showed a large majority of individuals to be below one, and the average score to be .65, therefore the cut point of 1.4 is more than double the average and is a conservative estimate of those displaying signs of depression.

**Access to weapons.** At wave I individuals were asked, *“Is a gun easily available to you in your home?”* Individuals that answer in the affirmative to this question will be coded with a 1 and individuals that do not have access to a gun will be coded as 0. No similar question is found at wave IV. This variable is critical to the model therefore be included at time one, but will be removed from the model when I review wave IV.

**Exposure to a family/friend suicide.** Exposure to suicide is asked in a two-stage question as it relates to friends and family. First the individual is asked, *“Have any of your friends tried to kill themselves during the past 12 months?”* If respondents answer in the affirmative they are then asked, *“Have any of them succeeded?”* The same question is asked regarding family attempts to kill themselves, with the same follow up question, *“Have any of them succeeded?”* A combined total of 4,477 accounts of previous exposure to a friend or a family member attempting to take their own life are indicated from the responses at wave I. Of the 4,477 accounts of exposure to attempted suicide the record reflects that 800 were successful.

Wave IV the questions are combined to include both the family and friends, *“During the past 12 months, have any of your family or friends tried to kill themselves?”* A follow up

question is given at wave IV to those that answered “yes” similar to the follow up question at wave I. The follow up question was, “*Have any of them died as a result?*” The survey shows that 1,002 (6.38%) people indicate that a friend or a family member had tried to commit suicide in the 12 months prior to the administration of the survey. Of the 1,002 individuals that were indicated to have tried to commit suicide respondents indicated that 327 resulted in a death.

For analysis reasons we will be reviewing the effect of being exposed to suicide in any form at both waves and will be reviewing the effects that being exposed to a family or friend that has completed or attempt suicide. Those that indicate that they have known of a family or friend that has attempted will be coded with a 1 and those that are not exposed will be coded with a 0. Due to the fact that Wave IV asked the question in slightly different way we will create a variable using wave I data to match wave IV by combining the two questions asked at wave I of attempted suicide for family and the other for attempted friend.

### ***Control variables***

**Sex.** The respondent’s sex is notated by the interviewers in the “BIO\_SEX4” section. 7,349 (47%) individuals are reported to be male and 8,352 (53%) of the respondents are reported to be female. Sex will be coded as 1 = male and 0 = female.

**Age.** Respondent’s age was collected at the time of the interview by asking the respondents the year, day and month that they were born. This information was then used to determine the exact age of each respondent in days based on the date the survey was administered, which was then converted into years for convenience of interpretation. Wave I data collects data of adolescent aged individuals, average age of 16, and wave IV data

collects information from the same individuals 13-14 years later, when they have aged out of adolescence and into early adulthood.

**SES.** SES is measured as an average of the parent's occupational prestige, based on census occupational group codes and parent's educational attainment. Both mother and father's scores were standardized on each measure and then an average of those four items (two for those with only one parent) were taken to create SES.

### *Analytical Plan*

Analyses for this thesis were conducted in a multi-staged approach. The first stage of the analysis process was conducting a univariate analysis. Stage two of the data analysis was conducting bivariate analysis of the variables to establish whether a relationship exists between the variables. The last stage of data analysis was conducted using logistic regressions to test the direct and indirect effects on the dependent variable. Analyses for this study were conducted using SPSS and STATA. The preliminary analyses used the Statistical Package for the Social Sciences (SPSS). Final analyses were conducted in Stata, to adjust for the complex design effects of the Add Health data collection.

I followed Baron and Kenny's (1986) traditional mediation model approach. First, the effects of the race variables and control variables on the mediators were examined. Once this was complete two models were created for each wave. Model one at each wave includes the race and control variables to see if significant differences in suicidal ideation are seen. Following this, model two at each wave (one and four) introduced the mediating variables that have been hypothesized to mediate the relationship between race and suicidal thoughts. For a more detailed review of which variables were have the greatest

impact on the dependent variable separate models were created at wave one that included the race groups, the controls and each hypothesized mediating variable one at a time.

## Chapter IV.

### Results

**Univariate Results.** Table 3 presents the descriptive statistics for all of the variables included in the study, including the dependent variable, independent variables, and the control variables. As seen in Table 3, 14% of individuals at wave one of the data collection thought about suicide, but at wave four this figure drops to 7%. Table 3 indicates that only 3% of the sample is American Indian. While this percentage appears to be low, this translates into a total of 740 American Indians, which is sufficient for the multivariate analyses that follow. The mean age of the individuals at wave one was 16.03 years old. It is important to note the trend of higher risk problems at wave one compared to wave four. For example, both depression and exposure to suicide see larger numbers of individuals that report in the affirmative at wave one than at wave four. The percentage coded as depressed at wave one is 18% and this figure decreases to 14% by wave four. Likewise, individuals indicate that they are exposed to friend and family members that attempt, but don't complete suicide more at wave one (17%) than at wave four (4%). Additionally, those that indicate that a friend or family member committed suicide at wave one represented 4% of the sample, but again this figure decreases to 2% at wave four.



Table 3. Descriptive Statistics

<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Range</b>
Thought about suicide (Wave 1)	0.14	0.34	0-1.0
Thought About Suicide (Wave 4)	0.07	0.25	0-1.0
American Indian	0.03	0.18	0-1.0
White	0.59	0.49	0-1.0
Black	0.17	0.38	0-1.0
Hispanic	0.09	0.29	0-1.0
Other	0.12	0.32	0-1.0
Age	16.03	1.68	11.39-21.39
Sex	0.49	0.50	0-1.0
Socioeconomic Status	0.11	0.87	-2.11-1.60
Depression (Wave 1)	0.18	0.39	0-1.0
Depression (Wave 4)	0.14	0.35	0-1.0
No drinking (past 12 months; Wave 1)	0.69	0.46	0-1.0
No Drinking (past 12 months; Wave 4)	0.34	0.47	0-1.0
Drank 1 or 2 days in past 12 months (Wave 1)	0.14	0.34	0-1.0
Drank 1 or 2 days in past 12 months (Wave 4)	0.31	0.46	0-1.0
Drank once a month or less in past 12 months (Wave 1)	0.07	0.25	0-1.0
Drank once a month or less in past 12 months (Wave 4)	0.16	0.37	0-1.0
Drank 2 or More Times a Month (Wave 1)	0.10	0.31	0-1.0
Drank 2 or More Times a Month (Wave 4)	0.19	0.40	0-1.0
Friend or Family Attempted suicide, without complete (Wave 1)	0.17	0.38	0-1.0

Friend or Family Attempted suicide, without complete (Wave 4)	0.04	0.20	0-1.0
Friend or Family Completed suicide (Wave 1)	0.04	0.18	0-1.0
Friend or Family Completed suicide (Wave 4)	0.02	0.14	0-1.0
Access to weapons	0.25	0.43	0-1.0

**Bivariate Results.**

Wave1. Table 4 presents the cross tabulations between the independent variables and control variables, and the dependent variable (thought about suicide) at wave one. A planned comparison was conducted to compare the American Indian group and all other racial groups for differences between groups in suicidal thoughts. Almost every included variable is significantly associated with, at the bivariate level, with suicidal ideation. The only comparison that is not significant is the lack of a significant difference between the “other” racial group and American Indian group in suicidal ideation.

Table 4. Crosstabs at Wave 1.

Independent Variable	Not		P Value
	Suicidal Percentage	Suicidal Percentage	
American Indian <sup>a</sup>	81.25%	18.75%	---
White <sup>a</sup>	86.55%	13.45%	0.03*
Black <sup>a</sup>	88.53%	11.47%	0.01*
Hispanic <sup>a</sup>	88.35%	11.65%	0.01*
Other <sup>a</sup>	85.73%	14.27%	0.13
Male	89.99%	10.01%	0.00*
Female	82.98%	17.02%	
No Access to Weapons	87.49%	12.51%	0.01*
Access to weapons	84.31%	15.69%	
Not Depressed	91.39%	8.61%	0.00*
Depression	62.52%	37.48%	
No Drinking (past 12 months)	89.34%	10.66%	
Drank 1 or 2 days in past 12 months	82.98%	17.02%	0.00*
Drank once a month or less in past 12 months	81.43%	18.57%	
Drank 2 or More Times a Month	78.24%	21.76%	
Friend or Family that did not attempt or complete suicide	90.47%	9.53%	
Friend or Family Attempted suicide, without complete	73.68%	26.32%	0.00*
Friend or Family Completed suicide	67.39%	32.61%	

\* P < 0.05

<sup>a</sup> -Comparisons across AI, White, Black, Hispanic, and other with AI as the referent

Wave 4. Similar results to wave one are seen in Table 5 of the cross tabulations of the independent and control variables compared to the dependent variable at wave four. However, American Indians are no longer significantly different from the “other” racial group, but they are now significantly different from Hispanics. At wave one the smallest gap between American Indians and any of the other racial groups was the “other” group,

with approximately four-percentage point difference. At wave four, however, the smallest gap is between American Indians and Blacks with a roughly two-percentage point difference. An additional change from wave one to wave four was the change in level of significance for sex. At wave one, females were seven percentage points more likely (17.06 vs. 10.01) to have thought about suicide than their male counterparts. At wave four the difference between male and female suicidal thoughts decreased to a one-percentage point difference between the two groups. All other variables at wave four appear to maintain a significant association with suicidal thoughts, in the expected directions.

Table 5. Crosstabs at Wave 4.

Independent Variable	Suicidal Percentage	Suicidal Percentage	P Value
American Indian <sup>a</sup>	89.99%	10.01%	---
White <sup>a</sup>	93.05%	6.95%	0.18
Black <sup>a</sup>	92.06%	7.94%	0.45
Hispanic <sup>a</sup>	94.95%	5.05%	0.04
Other <sup>a</sup>	94.10%	5.90%	0.11
Male	93.53%	6.47%	0.15
Female	92.48%	7.52%	
No Access to Weapons	-	-	-
Access to weapons	-	-	-
Not Depressed	95.63%	4.37%	0.00
Depression	76.86%	23.14%	
No Drinking (past 12 months)	94.71%	5.29%	
Drank 1 or 2 days in past 12 months	93.24%	6.76%	0.00
Drank once a month or less in past 12 months	93.31%	6.69%	
Drank 2 or More Times a Month	90.15%	9.85%	
Friend of Family that did not attempt or complete suicide	93.37%	6.63%	
Friend or Family Attempted suicide, without complete	90.06%	9.94%	0.00
Friend or Family Completed suicide	85.10%	14.90%	

\* P < 0.05

<sup>a</sup> -Comparison across AI, White, Black, Hispanic, and other with AI as the referent

Continuous Variables. Two of the measures used in the study, age and socioeconomic status, were measured as continuous variables. Bivariate logistic regressions predicting suicidal ideations were conducted separately for each of these two variables once at wave one and

again at wave four. At wave one age was significantly associated with suicidal thoughts. At wave four, only SES was negatively associated with suicidal ideation.

Table 6. Bivariate logistic regressions predicting suicide.

Variable	Coefficient	Std. Error	t
Age	0.06	0.02	2.61*
SES	0.01	0.04	0.19
Age	-0.04	0.03	-1.22
SES	-0.19	0.06	-3.05*

\* P < 0.05

Line break denotes separate analysis of wave one bivariate logistic regression of control variables (Wave 1 on the top & Wave 4 below the line).

### Multivariate Results

The effects of the different racial groups and the control variables on the mediators were tested separately for data at wave one and wave four. At wave one, as shown in Table 7, depression was not significantly related to any of the racial groups, but seemed to be significantly affected by the control variables (age, sex, and SES). At wave four, depression was still significantly affected by sex and SES, but no longer by age.

Those that had been exposed to a family or friend that completed suicide displayed interesting findings. At wave one, all race groups and controls are significant. Meaning that White, Blacks, Hispanics and Others all were found to significantly decrease the likelihood of exposure to family or friend completed suicide when compared to AI/AN. However, at wave four the only significant relationship that remained was age when compared to exposure friend or family that completed suicide. Drinking at wave one was significantly related to Blacks, others, age, and sex, but at wave four the race effects are no longer significant and only the controls that were significant remain significant. In summary, the variables did not behave as predicted. Life strains such as exposure to suicide are

significantly associated with race in the expected direction (AI/AN have more life strains) at wave one, but are no longer significant at wave four. However, other variables did not seem to garner the same level of support. The model proposed in this study suggests that race differences in alcohol use at time one will be a significant factor for AI/AN suicide at wave one but no longer at wave four, yet the results seen in Table 7 shows that this relationship did not hold true. Similarly, the proposed model for this study suggested that depression would be a significant factor in explaining race differences of suicidal thoughts, however, findings of this study do not support this model. More specifically, depression was not significantly related to any racial group included in this study.

Table 7. Effects of Race and Control Variables on Mediators.

	Depression (wave 1)	Depression (wave 4)	Access to Weapon	Friend or Family Attempted, not completed (Wave 1)	Friend or Family Attempted, not completed (Wave 4)	Friend or Family completed Suicide (Wave 1)	Friend or Family completed Suicide (Wave 4)	Drinking Alcohol (Wave 1) <sup>a</sup>	Drinking Alcohol (Wave 4) <sup>a</sup>
<b>White<sup>b</sup></b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>
	-0.29	-0.43*	0.20	-0.43*	-0.32	-0.70*	-0.31	-0.16	-0.04
	Std. Error	0.16	0.22	0.21	0.31	0.30	0.50	0.15	0.19
<b>Black<sup>b</sup></b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>
	-0.15	-0.14	-0.77*	-0.65*	-0.52	-1.99*	-0.50	-0.57*	0.18
	Std. Error	0.21	0.25	0.22	0.30	0.36	0.53	0.16	0.20
<b>Hispanic<sup>b</sup></b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>
	-0.20	-0.76*	-1.17*	-0.29	-0.49	-1.46*	-0.39	-0.08	0.07
	Std. Error	0.25	0.27	0.22	0.28	0.46	0.54	0.15	0.19
<b>Other<sup>b</sup></b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>
	0.11	-0.25	-1.28*	-0.44*	-1.01*	-0.85*	-0.35	-0.35*	0.25
	Std. Error	0.21	0.17	0.24	0.42	0.39	0.56	0.19	0.19
<b>Age</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>
	0.15*	0.00	0.09*	-0.60*	-0.04	0.15*	-1.12*	0.28*	0.04*
	Std. Error	0.02	0.03	0.03	0.04	0.04	0.06	0.02	0.02
<b>Sex</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>
	-0.80*	-0.41*	0.71*	-0.73*	-0.24	-0.46*	0.03	-0.29*	-0.92*
	Std. Error	0.09	0.08	0.08	0.14	0.17	0.17	0.05	0.05
<b>SES</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>	<b>b</b>
	-0.30*	-0.25*	-0.14*	0.03	-0.05	-0.30*	-0.07	0.02	-0.34*
	Std. Error	0.05	0.05	0.04	0.08	0.10	0.11	0.03	0.04

P < 0.05

a- All models used logistic regression, with the exception of drinking at Wave 1 & Wave 4 which were computed using ordinal logistic regression.

b- All race variables were dummy variables that referenced everyone that was not included as their category (i.e., White vs. non-White, non-White as the referent)



Regression Models Predicting Suicide at Wave 1. Table 8 presents the logistic regression models predicting suicidal thoughts at wave one. In model one of Table 8, the race and control variables are included in the regression model. All racial groups, except the “other” group, are significantly different from American Indians in their suicidal thoughts, in that they think about suicide less than the American Indian individuals. This indicates that American Indians are significantly more likely to think about suicide than their racially different counterparts, holding age, sex and SES constant. Model two shows that when access to weapons, drinking behavior, depression, and exposure to attempted or completed suicide by family or friends are all included in the model, American Indians are no longer significantly different in their suicidal thoughts than their counterparts from other racial groups. Each of the mediating variables included in the model is significantly associated with suicidal ideation in the expected directions, with the exception of drinking once or twice in the past 12 months.

It is unclear which of the variables are contributing to the mediation effect seen in Table 8. For this purpose Table 9 was included to evaluate each variable one at a time, this way it becomes clear which variable is contributing most to AI/AN increased suicidal thoughts and which variables are not explaining the mediation. Table 9 shows that access to weapons and drinking behaviors had no mediation effects. Model 4, of Table 9 shows the impact that depression had on AI/AN suicidal thoughts. Depression did not show full mediating effects on AI/AN suicidal thoughts, but shows some signs of slight mediation. When depression was added into the model we note a change in the coefficients across racial groups in large fashion with the exception of the Black group. Specifically, White coefficient went from -.43 before depression to .01 after depression was included. Hispanic

coefficient reduced from -.57 to -.25 and the “other” group saw a change in coefficient from -.34 to -.4 after depression was included. Table 9, model 5, shows the variable that appears to be responsible for the largest portion of mediation of AI/AN suicidal thoughts. Model 5 was the inclusion of being exposed to family or friend completing or attempting suicide. Again, coefficients are greatly reduced when exposure to suicide is included in the model. Whites start at -.43, but end at -.17 after exposure to suicide is added. The Hispanic group coefficient changes from -.57 to -.29 and the “other” group changes from -.34 to .08. In summary, full mediation cannot be attributed to one single predictive factor, but is only seen in the inclusion of all the predictive measures.

Table 8. Regression Models at Wave 1.

Variables	Model 1.			Model 2.		
	b	Std. Error	Odds Ratio	b	Std. Error	Odds Ratio
White <sup>a</sup>	-0.43*	0.19	0.65	-0.25	0.21	0.78
Black <sup>a</sup>	-0.63*	0.21	0.53	-0.31	0.23	0.73
Hispanic <sup>a</sup>	-0.57*	0.23	0.56	-0.35	0.25	0.70
Other <sup>a</sup>	-0.34	0.22	0.72	-0.18	0.22	0.83
Age	0.08*	0.02	1.81	0.01	0.03	1.01
Sex	-0.63*	0.09	0.53	-0.38*	0.09	0.69
SES	0.01	0.05	1.01	0.14*	0.05	1.15
Access to weapons				0.25*	0.10	1.29
Drank 1 or 2 days in past 12 months				0.23	0.13	1.26
Drank once a month or less in past 12 months				0.36*	0.15	1.43
Drank 2 or More Times a Month				0.56*	0.14	1.75
Depression				1.68*	0.09	5.36
Family or friend Attempted Suicide, without complete				1.02*	0.09	2.77
Family or Friend Completed Suicide				1.16*	0.16	3.18

\* P < 0.05

<sup>a</sup> - The excluded referent category is AI/AN

Table 9. Regression Models of Each Mediator One at a Time Predicting Suicide-Wave 1 Wave 1.

Variables	Model 1.		Model 2.		Model 3.		Model 4.		Model 5.	
	b	Std. Error	b	Std. Error	b	Std. Error	b	Std. Error	b	Std. Error
White	-0.43*	0.19	-0.32*	0.15	-0.31*	0.15	0.01	0.16	-0.17	0.15
Black	-0.63*	0.21	-0.52*	0.16	-0.46*	0.16	-0.43*	0.18	-0.67*	0.17
Hispanic	-0.57*	0.23	-0.36*	0.18	-0.38*	0.18	-0.25	0.19	-0.29	0.18
Other	-0.34	0.22	-0.03	0.16	-0.01	0.17	-0.04	0.18	0.08	0.17
Age	0.08*	0.02	0.06	0.02	-0.00	0.02	0.00	0.02	0.08*	0.18
Sex	-0.63*	0.09	-0.72	0.06	-0.69*	0.03	-0.34*	0.07	-0.51*	0.06
SES	0.01	0.05	-0.02	0.03	-0.03	0.03	0.10	0.04	-0.01	0.04
Access to Weapon			0.47	0.07						
Drank 1 or 2 days in past 12 months					-0.51*	0.8				
Drank once a month or less in past 12 months					0.68*	0.11				
Drank 2 or More Times a Month					-0.95*	0.09				
Depression							2.01*	0.07		
Family or friend Attempted Suicide, without complete									1.21*	0.07
Family or friend Completed Suicide									1.65*	0.12

\* P < 0.05

Logistic Regression Models Predicting Suicide at Wave 4. Table 10 presents the logistic regression models predicting suicidal ideation at wave four. Holding constant age, sex, and SES, American Indians are no longer significantly different from their counterparts from different ethnic backgrounds, with the exception of Hispanics. While only one significant relationship is seen in model one of Table 10, it is valuable to note that the coefficients are reduced substantially in model 2, when the mediating variables are introduced. For instance, the White coefficient in model 1 is -.31, but in model 2 that coefficient drops by almost half to -.17. Similar reductions are seen in the Black and Hispanic race groups. The Black coefficient in model 1 is -.22, but is halved in model 2 and the Hispanic coefficient in model 1 is -.76, but drops to -.47 in model 2, when the mediators are introduced. The mediators that are included in this model again show significant relationships between suicidal ideation and heavy alcohol drinking, depression, and exposure to suicide by friends and family. While Baron and Kenny's (1986) traditional mediation models may not qualify this a mediation because a significant relationship is not established in model 1, work is being done that may allow for more sophisticated statistical analysis that would argue that what is happening in these model are, in fact, mediation. Mackinnon (2007) describes in detail the multitude of approaches that one can take to mediation models for social science and often disagrees with Baron and Kenny's (1986) model of mediation that states that significance must be present in the first model to be mediated. Mackinnon argues that partial mediation is possible given the algebraic equivalence shown of Barron and Kenny's model (see Krull & MacKinnon 1999; MacKinnon & Dwyer 1993).

At wave one steps were taken to include each variable one at a time to have a more detailed understanding of which variables contributed the most to the initially seen mediation in Table 8. Likewise, similar steps were taken at wave four data analysis, shown on Table 11. Although mediations does not take place at wave four, it is important to note the factors that have the greatest impact on reducing the coefficients between race groups. Unlike Table 8 that showed that exposure to suicide was the largest contributor to change in coefficients; wave four was impacted by depression the most.

Table 10. Regression Models at Wave 4.

Variables	Model 1.			Model 2.		
	b	Std. Error	Odds Ratio	B	Std. Error	Odds Ratio
White	-0.31	0.30	0.73	-0.17	0.33	0.84
Black	-0.22	0.34	0.80	-0.11	0.36	0.90
Hispanic	-0.76*	0.35	0.47	-0.47	0.37	0.62
Other	-0.56	0.35	0.57	-0.44	0.39	0.65
Age	-0.04	0.03	0.96	-0.03	0.03	0.97
Sex	-0.15	0.11	0.86	-0.12	0.11	0.89
SES	-0.21*	0.06	0.81	-0.15*	0.07	0.86
Drank 1 or 2 days in past 12 months				0.25	0.15	1.28
Drank once a month or less in past 12 months				0.33	0.17	1.39
Drank 2 or More Times a Month				0.66*	0.16	1.93
Depression Family or friend Attempted Suicide, without complete				1.82*	0.12	6.20
Family or Friend Completed Suicide				0.36	0.22	1.44
				0.74*	0.28	2.11

\* P < 0.05

Table 11. Regression Models of Each Mediator One at a Time Predicting Suicide-Wave 4

Wave 4.								
Variables	Model 1.		Model 2.		Model 3.		Model 4.	
	b	Std. Error	b	Std. Error	b	Std. Error	b	Std. Error
White	-.31	.30	-.18	.21	.02	.21	-.14	.21
Black	-.22	.34	-.02	.22	.03	.23	-.07	.22
Hispanic	-.76*	.35	-.33	.24	-.12	.25	-.37	.24
Other	-.56	.35	-.40	.24	-.30	.25	-.40	.24
Age	-.04	.03	-.35	.02	-.05*	.02	-.05*	.02
Sex	-.15	.11	-.40*	.08	-.08	.08	-.24*	.08
SES	-.21*	.06	-.17*	.05	-.07	.05	-.16*	.05
Drank 1 or 2 days in past 12 months			.24*	.11	-	-	-	-
Drank once a month or less in past 12 months			.36*	.13	-	-	-	-
Drank 2 or More Times a Month			.83*	.11	-	-	-	-
Depression			-	-	1.93*	.08	-	-
Family or friend Attempted Suicide, without complete			-	-	-	-	.46*	.16
Family or Friend Completed Suicide			-	-	-	-	.85*	.21

\* P < 0.05



## **Chapter V.**

### **Discussion and Conclusions**

The aim of this study was to use Agnew's General Strain theory to explain why AI/AN adolescents showed signs of increased suicidal thoughts compared to their non-AI/AN counterparts. I hypothesized that AI/AN adolescents would show signs of higher strain that caused increased suicidal thoughts, but when those same individuals grew older into early adulthood that those strains would decrease in strength. To test this I used a nationally representative sample of adolescents, which included a representative sample of the AI/AN population. Using Baron and Kenney's (1986) causal steps approach to mediation as my analysis framework, I examined the GST specified theoretical model where race leads to strain, which in turn leads to suicidal thoughts.

Findings from this study generally support the application of GST as a means to explain increased suicidal thoughts of AI/AN adolescents. The first proposed hypothesis stated that AI/AN adolescents would have higher suicidal thoughts compared to non-AI/AN groups, at wave one. The results presented in Table 4 confirm that AI/AN adolescents do have a significant increase of suicidal thought compared to their non-AI/AN populations. AI/AN adolescents were significantly more likely to report suicidal thoughts than each of the other racial groups, with one exception- the "other" race group.

My second hypothesis stated that AI/AN adult suicidal thoughts would no longer be different, when compared to non-AI/AN populations, at wave four. Again, this hypothesis found support in the data analysis. Table 5 shows the direct comparisons of AI/AN to their non-AI/AN race groups and the logistic regression shows that at wave four AI/AN are no longer significantly different from their counterparts. The only exception noted at wave

four was found in the comparison of AI/AN and Hispanics. Meaning, Hispanics were the only racial group at wave four to have a significantly lower likelihood of suicide ideation than American Indians.

The importance of these two results indicates that AI/AN populations are at greater risk of thinking about suicide in adolescent years, compared to when they grow older. As individual's age into adulthood American Indians no longer think about suicide at a significant increased rate compared to other racial groups, with the exception of Hispanics that are less likely to think about suicide compared to American Indians. Therefore, it becomes imperative to understand what mechanisms are contributing to an increase in suicidal thoughts for AI/AN adolescents. Having this understanding would lead to a more targeted approach at intervening in the early stages of suicide, for this specific at-risk population.

In an attempt to understand what factors increased suicidal thoughts in the adolescent years, I utilized GST. GST suggests that strains, coping and support processes are important in understanding suicidal thoughts. For this reason my third hypothesis was that the impact of being AI/AN on suicidal thoughts will be mediated by strains, negative coping behaviors, and negative emotions (alcohol/substance abuse, depression, access to weapons, and exposure to family/friend suicide). All of these variables are found to be important correlates of suicide, based on the GST model, with the exception of access to weapons, which was included because the extant literature suggests that AI/AN population may have more access to weapons, specifically guns, which increases not only their completion rate of suicide, but also their suicidal thoughts because knowing that one has

access to a viable option to attempt suicide increase chances of considering/thinking about suicide.

As with Hypotheses 1 and 2, hypothesis 3 also found support in this study, at wave one. Table 8 and 9 show the regression models at wave one, including race groups and the control groups to know if AI/AN adolescent suicide was still significant when controlling for sex, age, and SES. In Table 8, model 1, AI/AN are still significantly different from the other race groups. Consistent with hypothesis 3, however, when the mediating variables were included in the model, the race groups are no longer significantly different. The coefficients were reduced in all of the race groups by nearly half. Specifically, before the mediating variables were included into the model the White coefficient was -0.43 but is reduced to -0.25 upon inclusion of the mediators. The Black coefficient was reduced from -0.63 to -0.31 and Hispanic coefficient was reduced from -0.57 to -0.35, after the mediating variables were introduced. Lastly, the “other” race category was reduced from -0.34 to -0.18 after the mediating variables were introduced. In all cases statistical significance is no longer present and a large reduction in the coefficients are seen, consistent with the mediation hypothesis.

Hypothesis 4 stated that exposure to family/friends that attempt or complete suicide and Alcohol abuse/use will no longer affect race differences on thought of suicide. This hypothesis was included as an attempt to understand which factors were of importance in adolescent years, but not as vital in adulthood. The extant literature of suicide and GST suggest that coping mechanisms are increased, as people get older; therefore, I hypothesized that the need to use alcohol as a negative coping mechanism

would no longer contribute to suicidal thoughts. Likewise, as individuals get older being exposed to family and friends that attempt or complete suicide might not be as detrimental.

Hypothesis 4 found some support, but with some limits. For instance, alcohol use at wave one was significant in all categories of drinking besides those that drank once or twice in the past twelve months, but at wave four the only drinking category that remained significant was the group that drank the most often and all other groups no longer were significant. Additionally, exposure to suicide was hypothesized to no longer be significant predictor of suicidal thoughts at wave four, but again only showed signs of mixed support. At wave one both exposure to a friend/family attempting to commit suicide and a friend/family member that completed suicide were significant predictors of suicidal thought. Wave four, however, indicated that being exposed to a friend/family member that completed suicide was the only significant predictor of suicidal thought. No longer was being exposed to a friend/family a significant predictor of suicide.

### **Policy Implications**

From the findings of this study strong support is given to the notion that adolescent AI/AN's are at increased risk for suicidal thought and that specific factors contribute to said increase. For this reason several policy implications emerge from this study. Given that in adolescence all the hypothesized mediating variables were significantly associated with suicidal thoughts, a majority of the policy recommendations are aimed at addressing those factors specifically.

The first and most robust factor that appeared to impact AI/AN youth is depression. The results for depression in Table 8 show that the odds ratio for depression was 5.36. This odds ratio is nearly two times that produced by the next strongest correlate of suicide-

exposure to family/friend suicide completion (3.18). It is not a new or uncommon finding in the suicide literature to find depression to be such a robust correlate of suicide or suicidal thought, however, while depression was not a mediator in this study it is still of large concern for all racial groups. Therefore, depression and mental health concerns are at the forefront of policy changes that need to occur to help this population. Increased screenings for depressive symptoms could take place during these sensitive years in schools and at yearly check ups/physicals. The more often that depression symptoms are checked and screened, the likelihood of being able to find this at risk population and provide aid before it becomes too late increases.

General screenings and check ups that look for depression symptoms are optimal for a proactive treatment, but addressing the needs that come with being exposed to suicide of a family or friend is much more reactive by its very nature. Although it may be difficult to be proactive in seeking out those that have been exposed to suicide completions or attempts, policies can be implemented that focus on the needs of family members along with the needs of those that have attempted suicide. In cases that an attempted or completed suicide is reported a response team could follow up with direct family members for support. Additionally, since these are school-aged students and exposure is not limited to just family members, but also includes friends, a similar support team could be implemented at schools to give aid to the friends of those that have attempted or completed suicide. School specific intervention programs have been attempted in the past and appear to have positive impacts for those involved (Kalafat & Elias, 1994). Additionally, family and friend interventions have been evaluated and discussed for best practices on

how to intervene with those that are in bereavement due to a loss of a love one via suicide (for more detail see, Jordan & McMenemy, 2004).

The third element that should be addressed from a policy standpoint is adolescent drinking of AI/ANs. The results of this study show that drinking becomes less of a problem, as adolescent AI/AN populations grow older, but is still important in early years of life. This becomes even more important when considering that in adolescent years AI/AN youths do not need to be heavy drinkers to increase their odds of suicidal thought, and that the consumption of smaller amounts of alcohol appear to be significant in increasing their suicidal thoughts. Two types of programs could be implemented to address the issue. Number one, programs could be implemented that attempt to deter under age drinking. The second approach to adolescent age drinking of AI/AN populations is to help those that have already begun drinking. Hawkins and colleagues (2004) have reviewed the extant literature of the effectiveness of some of these types of programs for AI/AN youth and found some best practices to follow. They say,

These include principles and strategies that have demonstrated the potential and promise to help reduce the severity of problems caused by alcohol and drug use. They include (a) conceptualizing prevention and behavior change as part of a continuum, (b) using a stepped-care approach, (c) utilizing a biculturally focused life skills curriculum, and (d) establishing community involvement and collaboration throughout the development and implementation of prevention efforts. (Hawkins et al. 2004, p. 315).

Continued work should be focused on helping AI/AN adolescent drinking behaviors.

The last set of policy implications that derive from this study relate to access to weapons, especially firearms. It has been suggested that AI/AN populations would have more access to firearms and that this access would increase suicidal thoughts; this study substantiated, at least in part, these claims. Owning a gun did not show to have much of an effect when included into a model by itself, but may still be of importance for safety in general. Firearm ownership is a controversial topic because of the constitutional right to bear arms, but becomes even more controversial considering AI/AN populations that operate under their own set of sovereign laws. While it is controversial, it is important that some form of intervening practice be taken to prevent undue harm via suicide to this special population.

### **Limitations**

Several limitations of this study must be acknowledged for this study. First, it is important to distinguish again that the AI/AN sample included in this study were AI/AN individuals that are students enrolled in schools that are not located on reservations. We cannot say with confidence that all those included in this study did not live on reservations, because it is possible that some of the AI/AN students traveled to schools not on the reservations. However, it is clear that the data do not generalize to those American Indians that attend reservation schools. Also, discussion of AI/AN population becomes commonplace, but it is vital to remember that there are hundreds of different tribes and AI/AN groups in the United States of American and structural, cultural, and historical differences are real between these tribes. Therefore, information of this study is limited to explaining suicidal thought differences of those AI/AN populations that were included in this study, which there is no way to parse out.

This study was developed to understand race differences between AI/AN populations and other racial groups on suicide over time. The very nature of data collection did not allow for a review of all cases that were present at wave one. Those that did not complete the survey at wave one and four were excluded. The exclusion of the group that did not make it to wave four could be argued to be systematically different than those that did make it to wave four. For this reason a sample selection sensitivity analysis was completed and is attached as Appendix A.

In Appendix A, a majority of the variables do indicate that there is a significant difference between those included in the study and those excluded. However, the large sample size could be a driving factor in presenting significant results. Therefore, it becomes important to review the magnitude of the differences between the included and the excluded sample. Only four variables reach a 5% point difference between those included in the study compared to those that were excluded. The four variables that reached 5% difference are Whites, Blacks, access to weapons and those that have never had a drink in the past 12 months. The study sample had roughly 68% whites included, but looking at the sample that was excluded 54% is white. Additionally, Blacks account for roughly 19% of the study sample, but are much more present in the excluded sample at almost 28%. The excluded sample had roughly a 5.5% magnitude difference in access to weapons, meaning that a good portion of the sample excluded had more access to weapons than the study sample. Lastly, it appears as if the excluded sample had more individuals that had not had a drink in the past 12 months compared to the sample used for the study. These differences may indicate that the results of this study may not generalize to the population that did not complete the survey.



It is with caution that I would make claims to causation. Suicide is a complex phenomenon and when that complex phenomenon is coupled with making comparisons between different complex racial and ethnic groups, one can never be certain that confounding variables are not influencing the results presented. It is not certain if the lived experience of being an AI/AN off the reservation is associated with more strains than living on the reservation. For example, living off the reservation could relieve one of many of the negative structural limitations associated with reservation life (i.e., increased poverty, less access to medical/mental care, and less access to proper nutritional diet), but it is not certain if being an AI/AN off the reservation also reduces family support, cultural identity, and or community support.

The measurement used to capture drinking behaviors presents a limitation in the lack of specificity I was able to parse out from the available responses. The survey question that asks respondents about their drinking behavior uses small incremental differences, however, I chose to group all those that have been drunk 2 or more times a month together. This means that those that drank twice in a month and those that drank 100 plus times in a month are measured the same. However, the results still show that this conservative method of including those that drank twice a month is still a predictive factor for suicidal thoughts at both wave one and wave four.

The choice to use suicide ideation as the dependent variable also presented some challenges. The survey simply asks respondents if they have “seriously considered committing suicide” in the past 12 months. Thoughts and interpretation of this question is variable between persons. The answer to this question is subject to the respondents’ subjectivity. To overcome the lack of objectivity I attempted to use the survey question that

asks respondents if they have attempted suicide in the past 12 months, but due to attempted suicide being such a rare event; it became clear that I would not have sufficient statistical power, especially to make race group comparisons.

Lastly, it is valuable to acknowledge that I did not have data at wave four for those that had access to weapons or not, so it was not included in the model. This measure was primarily an exploratory measure due to previous literature suggesting that access to weapons may be vital in suicidal thoughts. This study has partially substantiated the suggestion that having increased access to weapons is a problem for AI/AN populations and, in turn, suicidal thoughts. Therefore, from this point forward data should be captured related to AI/AN access to weapons, as adolescents to better understand its influence on suicidal thoughts and suicidal attempts.

### **Recommendations for Future Research**

Given the results and limitations of this study, several recommendations for future research will now be given. While the sample size was sufficient for a representative national sample, a larger sample could help overcome some of the statistical limitations found when exploring such a rare event amongst a specialized population. In a similar vein, previous research has tended to focus exclusively on reservation-based life experiences of AI/AN populations, yet we know that a large majority of AI/AN populations do not live on the reservations anymore. Therefore, more work should be done to collect data of AI/AN individuals that do not live on reservations, similar to that provided here.

This study included an exploratory measure thought to be linked to suicidal thoughts (access to weapons) and future research should also include more exploratory measures in their studies, such as . Given the support found for Agnew's general strain

theory, more work should be done to include other common GST measures into models to explain adolescent suicide of AI/AN populations, such as.

Future research should also continue to build on the longitudinal component of this study. This study used data that allowed for a review of the changes in suicidal thoughts of AI/AN individuals from adolescent age as they progressed into adulthood, but more research should be conducted to further explore at what point AI/AN populations are at their highest risk and when a turning point occurs. Having a better understanding of the exact years that are the highest risk could add a certain level of precision that could benefit intervention-centered policy.

Lastly, future data collections could ask follow up questions about reservation experiences. Knowing if the urban AI/AN sample collected is very similar to their reservation counterparts can be accomplished by asking if they have ever lived on the reservation at some point, how long they lived on reservations, why they left reservations, family members and friends that still live on reservations. All of these factors can contribute to how similar urban and reservation AI/AN look alike. The more we understand the spatial distance urban AI/AN have from reservation AI/ANs, research will begin to understand the special life and organizational differences between these two groups.

Appendix A: Sample Selection Sensitivity Analysis.

Variable	Included	Excluded	Chi-Square/t-test	Magnitude of the difference
Thought about suicide	14.0%	13.0%	.58	1.0%
American Indian	3.4%	3.8%	.16	-0.4%
White	68.3%	54.7%	.00*	13.6%
Black	18.9%	27.6%	.00*	-8.7%
Hispanic	15.0%	19.1%	.00*	-4.1%
Other	8.3%	10.6%	.00*	-2.3%
Age <sup>a</sup>	16.03	16.27	.06	-0.24
Socioeconomic Status <sup>a</sup>	0.11	-0.14	.00*	0.25
Male	49.3%	49.7%	.59	-0.4%
Female	50.7%	50.3%		0.4%
No Access to Weapons			.00*	0.0%
Access to weapons				0.0%
Not Depressed	91.70%	89.30%	.00*	-2.4%
Depression	8.3%	10.7%		-2.4%
No Drinking (past 12 months)	68.7%	74.9%	.00*	-6.2%
Drank 1 or 2 days in past 12 months	13.8%	10.2%	.00*	3.6%
Drank once a month or less in past 12 months	6.9%	5.3%	.00*	1.6%
Drank 2 or More Times a Month	10.6%	9.5%	.01*	1.1%
Friend or Family Attempted suicide, without complete	17.8%	14.5%	.00*	3.3%
Friend or Family Completed suicide	2.9%	3.2%	.29	-0.3%

\* P < 0.05

<sup>a</sup> – Tested using Independent Samples T-test. Numbers reported are means.

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## CURRICULUM VITAE

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(Updated: 08/2015)

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### Education

2015-Current Ph.D. Sociology  
University of Nebraska-Lincoln

2015 M.A. Criminal Justice  
Georgia State University  
**Thesis:** "Suicide Amongst Adolescent American Indian's in a Longitudinal Context"

2013 B.S. Major: Criminal Justice Minor: Legal Studies  
Weber State University

### Professional Experience

05/2015 – Current Student Instructor  
**School:** Georgia State University  
**Class:** Criminal Justice 2200- Social Science and the American Crime Problem

08/2014 – 05/2015 Graduate Research Assistant  
**Assignment:** Dr. Brent Teasdale

01/2014 – 05/2015 Critical Thinking Through Writing Assistant  
**Assignment:** Clinical Instructor Michael Shapiro, J.D.

08/2013 – 12/2013 Graduate Research Assistant  
**Assignment:** Dr. Brent Teasdale

### Research Interests

Sociology:

Native American/Alaskan Native Populations, Substance Abuse, Suicide, Mental Health, and Stratification

Criminal Justice:

Sentencing Guidelines, Plea Bargaining, Conflict Theories, and Punitive Sentiment of the American Criminal Justice System

## **Honors and Scholarship Awards**

*The J.J. Eleanor S. Ogle Fellowship*, University of Nebraska-Lincoln, Lincoln, NE.

**Years Awarded:** 2015-2016, 2016-2017

**Amount:** \$2,000

*The American Indian Graduate Center Fellowship*, American Indian Graduate Center, Albuquerque, NM.

**Years Awarded:** 2013-2014, 2014-2015

**Amount:** \$5,000

*The Metlakatla Indian Community Group Scholarship*, Metlakatla Indian Community, Metlakatla, AK.

**Years Awarded:** 2010-2011, 2011-2012, 2012-2013, 2013-2014, 2014-2015.

**Amount:** \$3,000

*The Sealaska Heritage Institute Scholarship*, Sealaska Heritage Institute, Juneau, AK.

**Years Awarded:** 2011-2012, 2012-2013, 2014-2015, 2015-2016

**Amount:** Varies

*The American Indian Education Foundation Undergraduate scholarship*, American Indian Education Foundation, Albuquerque, NM.

**Years Awarded:** 2012-2013 (\$5,000)

**Amount:** \$5,000

*AmeriCorps Communities Volunteer Education Award (300 hours)*, The corporation for National & Community Service, Ogden, Utah.

**Year Awarded:** 2011

**Amount:** \$1,175

## **RESEARCH EXPERIENCE**

### **Publications**

#### **Book Chapters and Book Reviews**

Teasdale, Brent and Jerreed Ivanich. Forthcoming. "Longitudinal Methods in Substance Abuse Research" in J. VanGeest, S. Alemagno, & T. Johnson (Eds.) *Handbook of Substance Abuse Research Methods*. Springer Press.

### **Presentations**

Ivanich, Jerreed and Brent Teasdale. "Suicide amongst Adolescent Native Americans in a Longitudinal Context." Paper presented at the annual meeting of the Academy

of Criminal Justice Sciences. March, 2015.

## **PROFESSIONAL SERVICE**

### **Service to the University**

#### **Weber State University:**

- Member, Student Fees Recommendation Committee 2012, 2013
- Non-Traditional Student Senator, Weber State University Senate 2011 - 2012

### **Service to Discipline**

Accountability Courts Conference:

*Drug Courts Conference Volunteer & Participant* 2014

### **Service to Department**

#### **Georgia State University**

*Georgia State University-Department of Criminal Justice and Criminology:*

- Vice President, Criminal Justice Graduate Student Association 2014 - Current
- Member, Alpha Phi Sigma 2014 - Current
- Member, Criminal Justice Graduate Student Association 2013 - Current

## **PROFESSIONAL MEMBERSHIP**

Member, Academy of Criminal Justice Sciences 2014 - Current