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# The Legal Minimum Drinking Age: What Good Does it Do?

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## ABSTRACT

Underage drinking is a huge problem in the United States. Rational choice and deterrence theories suggest that the best way to deal with the problem is to create and enforce strict laws against underage drinking. However, are these truly effective mechanisms in this regard? This paper explores these issues by analyzing underage alcohol consumption patterns in three sets of states classified as “lax”, “strict” and “typical” in terms of their underage drinking laws using data from the 2012 National Survey of Drug Use and Health (NSDUH). T-tests did not show significant differences between underage alcohol use and binge drinking in the six randomly sampled typical states, strict states and the national averages. T-test suggested that alcohol use in the lax states was somewhat lower than the national average. Logistic regression results did not show a significant difference in the rates of underage alcohol use and binge drinking across the three different categories. They do, however, show a slight decrease in underage drinking over time, holding state type constant. The findings suggest that perhaps tougher laws, in and of themselves, do little to address this problem of underage alcohol consumption.

**Keywords:** underage drinking, alcohol legislation, deviant behavior

## INTRODUCTION

Consumption of alcohol by minors has an estimated societal cost of \$61.9 billion per year (Lipperman-Kreda et al, 2010). Alcohol consumption by underage Americans is implicated

in some 3,500 deaths, 1,200 cases of fetal alcohol syndrome, and triggered 57,000 admissions into alcohol treatment programs (Bonnie and O'Connell, 2004). Then there are the unwanted pregnancies, the suicides, the kids who use or abuse alcohol and get kicked out of school (Bonnie and O'Connell, 2004). Consequently, we try and fix the problem the way we know best – legislation. One hypothesized way to reduce alcohol use is by restricting access (Erickson, 2014). Exploring the efficacy of current alcohol legislation is essential to developing a comprehensive plan to combat the social costs of underage alcohol consumption.

## Background

A discussion of underage drinking is best prefaced with a historical understanding of the evolution of the minimum drinking age standard. During much of our nation's history, alcohol was predominately free of laws and regulations until the zeal of a growing temperance movement climaxed with the passage of the 18<sup>th</sup> amendment in 1919 and the beginning of the Prohibition era in the United States (Wolfson and Hourigan, 1997). The Volstead Act of 1920 provided legislation for enforcement of the newly adopted 18<sup>th</sup> amendment and with the amendment's repeal in 1933, birthed a wealth of alcohol related regulations (Wolfson and Hourigan, 1997). A legal minimum drinking age of 21 years was established across the nation and individual states classified underage possession and/or consumption as a statutory offense (Wolfson and Hourigan, 1997).

In 1971, the 26<sup>th</sup> amendment was ratified, spurring 31 states to drop their minimum legal drinking age in response to the lowering of the voting age from 21 to 18 (Wolfson and Hourigan, 1997). After seven years with a reduced minimum drinking age, Michigan was the first in a slow trend to restore the 21 years of age requirement. By 1984, states without a legal minimum drinking age of at least 21 were effectively forced by the federal government and faced losing significant funding for highways if the age requirement was not adopted (Office of Inspector General, 4). By 1988, the legal minimum age of 21 was collectively applied to the U.S with each state ratifying its own variation of legislation (Wolfson and Hourigan, 1997). Although the federal government ostensibly mandated states to legislate a minimum age of 21, the implementation of such a standard was beyond federal purview.

Legislated exceptions to the “21” rule and inconsistent enforcement of the law lead to a variety of outcomes when discussing the mandatory minimum drinking age. Even beyond the differing legislation among the states coupled with a lack of uniformity in enforcing the laws, Lipperman-Kreda et al. (2010) asserted, “Research indicates that there is considerable variability in alcohol policy and enforcement at the community level” (249). Currently 45 states permit underage consumption under prescribed circumstances ranging from religious purposes to educational purposes. For example, the Catholic Church endorses a sip of wine as part of the Eucharistic sacrament with the first communion taking place once the child has achieved the age of reason at 7years-old. It is also seen with culinary students, to allow underage consumption as long as the underage person is in view of a family member who is over the age of 21 (45 states, 2014). The discrepancies within policies are in conflict with the ideals of many who see criminalization of underage drinking as an effective way to combat youth-related problems that are exasperated by alcohol consumption.

## Sociological Perspectives on Underage Drinking

Several theories attempt to explain underage drinking from a sociological standpoint. Classical deterrence and rational choice theorists would assert that deviance, such as underage consumption of alcohol, takes place when a person’s hedonistic calculus finds the benefits of the deviant behavior are greater than the costs. While deterrence application is the foundation of criminalizing behaviors, Weil asserted that criminalizing substance use is misguided (Mosher and Akins, 2014). Weil concluded the drive of humans to alter consciousness is a universal quality that is often labeled as hedonistic, but that the appropriate course of action is to supply people with a true and unbiased picture of costs (such as health risks) and benefits (actual positive effects or sensations often associated with the substance use) so that the decision is rationally informed (cited in Mosher and Akins 2014). Critics of rational choice theories pointed to instances of deviance where the costs significantly outweigh the benefits and cases where emotion produces irrational choices.

Applying social bond theory to deviant behavior such as underage consumption of alcohol presumes that the more ties one has to the community in the form of attachment, commitment, involvement and belief, the less likely he or she is to engage in illegal

possession or consumption of alcohol (Mosher and Akins, 2014). The difficulty lies in applying the deviance label to status offenses, such as underage drinking, which places the behavior of drinking alcohol in the deviant category. This is based upon age since drinking alcohol is approved of within the culture of the United States.

Differential association theory purported that deviant behavior is learned and is the result of associating with others who engage in similar behaviors (Mosher and Akins, 2014). Criminologists would identify peer groups among those to hold the greatest influence in advocating pro-deviant behaviors; therefore, drinking with peers while underage would encourage the deviant act of underage drinking, creating unique subcultural norms. Critiques of this viewpoint suggested that while differential association is implicated in the acquisition of deviant norms, it does not explain the continuation of the deviant behavior after undergoing serious negative sanctions, which is often the case in repeated criminal activities (Mosher and Akins, 2014).

Social learning theory, as developed by Ronald Akers and Robert Burgess (1966), explained the phenomenon as an interplay between reinforcement and punishment with social, psychological, physiological rewards and the influence of projected messages upon the learning of behavior. This outlook implicates the forces of operant conditioning as a cultural learning technique found within individual societal contexts. While social learning theories may make sense, the complexity of rewarding and punishing values at the individual and structural levels makes operationalizing this for research purposes cumbersome; consequently, there has been little empirical support generated.

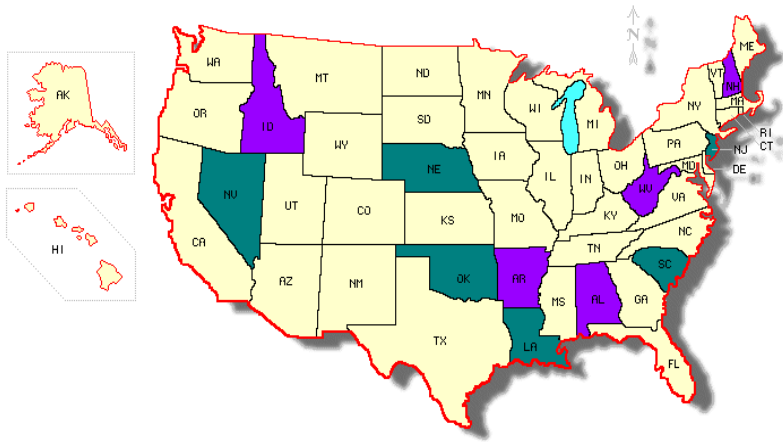
Within the context of these theories, there is found two ways to decrease underage drinking rates. Rational Choice Theory, which maintains that people act in their own self-interest and the rational self will balance the cost of an action against its possible rewards leading to a decrease in underage drinking rates with increased criminality or negative sanctions (Mosher and Akins, 2014). Alternatively, Social Bonding Theory holds that deviant actions are reduced when the number and strength of social bonds is augmented, predicting an inverse relationship between the rates of underage drinking and the level of positive societal attachment (Mosher and Akins, 2014). The objective of this study is to explore one aspect of this debate: the extent to which enhanced enforcement, in the form of stricter legislation, affects the likelihood of underage alcohol consumption. This research has

important policy implications, given the powerful influence of deterrence theory in the US Criminal Justice System.

## DATA AND METHODS

### Data

Using self-reported survey data collected by the Substance Abuse and Mental Health Services Administration, this study compared drinking rates in different states according to their approved exclusions for application of the legal minimum drinking age to identify legislative efficacy upon selected outcomes. To this end, it analyzed self-report data from the National Survey on Drug Use and Health (NSDUH) for 2003, 2009, 2010, 2011, 2012, and 2013 (<https://nsduhweb.rti.org/respweb/homepage.cfm>), which were the only years that could be accessed through NSDUH. NSDUH employs a random probability sampling method and sampling rates are preset for state and age group. This study uses data from the 12 to 20-year-old samples. This survey was administered by the Center for Behavioral Health Statistics and Quality for the Substance Abuse and Mental Health Services Administration (SAMSHA). Data for individual states were grouped into three categories based upon their policies regarding enforcement of the minimum legal drinking age of 21: strict states, lax states, and typical/moderate states (See Figure 1).



Key: Purple=Strict States Green=Lax States Yellow=Moderate/Typical States

**Figure 1: State-level enforcement of underage drinking laws.**

*Strict States* are the only five states to provide no exemption to the twenty-one minimum legal drinking age. The law does not allow for underage drinking under any circumstances in these states. These states are Alabama, Arkansas, Idaho, New Hampshire, and West Virginia (n=5). *Lax States* provide the most exceptions to the minimum legal drinking age and permit underage drinking as long as the alcohol is consumed on private property where liquor is not sold. This is the only restriction upon underage consumption in these six states. Parental consent is not necessary. These states are Louisiana, Nebraska, Nevada, New Jersey, Oklahoma, and South Carolina (n=6). *Typical or Moderate States* include the majority of the underage drinking policies in the United States with 39 of the 50 states falling into this category. These states set certain exemptions to the 21 minimum drinking age, variable by state, which include religious ceremonies, drinking under the supervision of parent or guardian, and educational purposes such as culinary students. These states fall in the middle of the *Strict States* and the *Lax States* in regards to the number of exemptions. Six typical states were selected as follows. The typical states were listed in alphabetical

order and assigned a number between one and thirty-nine. Six numbers were randomly selected using the integer generator at Random.org. The states corresponding to these numbers were included in the analysis. These typical states were Alaska, California, Georgia, Minnesota, New York, and Texas.

This study uses two dependent variables, underage alcohol use in the previous month and underage binge drinking in the previous month. The NSDUH data conceptualizes binge drinking as having consumed five or more drinks in one setting. Both variables are coded 0 for “no” and 1 for “yes”. The states were coded into a variable (state type), which was coded 0 for typical states, 1 for lax states and 2 for strict states. Year was coded in two different ways. First as an ordinal variable coded 0 for 2003, 1 for 2009, 2 for 2010, 3 for 2011, 4 for 2012 and 5 for 2013. Year was also coded as continuous variable. Ultimately, the latter version was employed for simplicity’s sake, as regression models yielded similar results with both versions of the year variable.

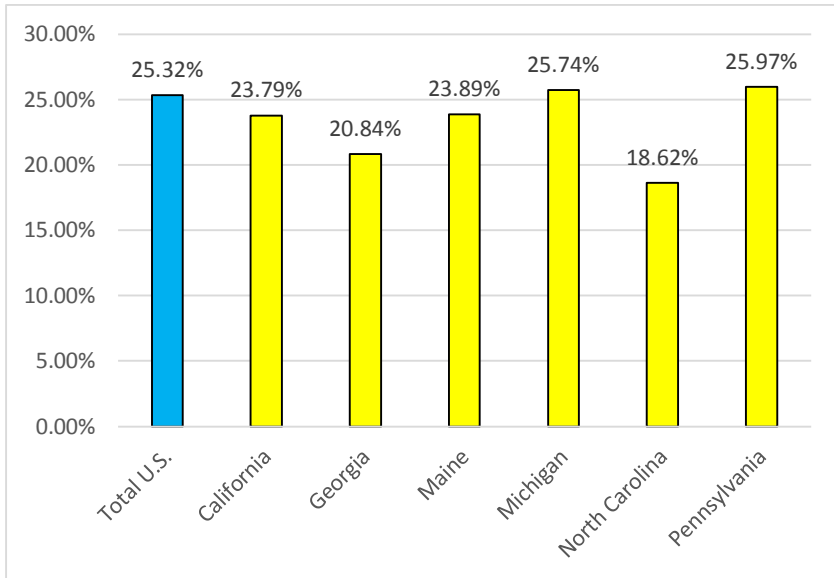
## Methods

Various analyses were employed in this study. First, current trends in underage alcohol use and binge drinking by state enforcement type were compared to the national average using t-tests. A t-test is used to determine whether there is a significant difference between the combined averages of the typical, lax, and strict states compared to the national average. Two-tailed tests were employed to gauge whether the states under study fell significantly below (left tailed) or above the national average (right tailed). Time series charts were created to discern any changes in underage alcohol use or binge drinking in the typical, lax, and strict states over time. Logistic regression was employed to determine whether there is a significant difference in the odds of underage alcohol use and binge drinking in the lax states versus typical states and the strict states versus typical states. Logistic regression was employed because two dependent variables, underage drinking and binge drinking are dichotomous.



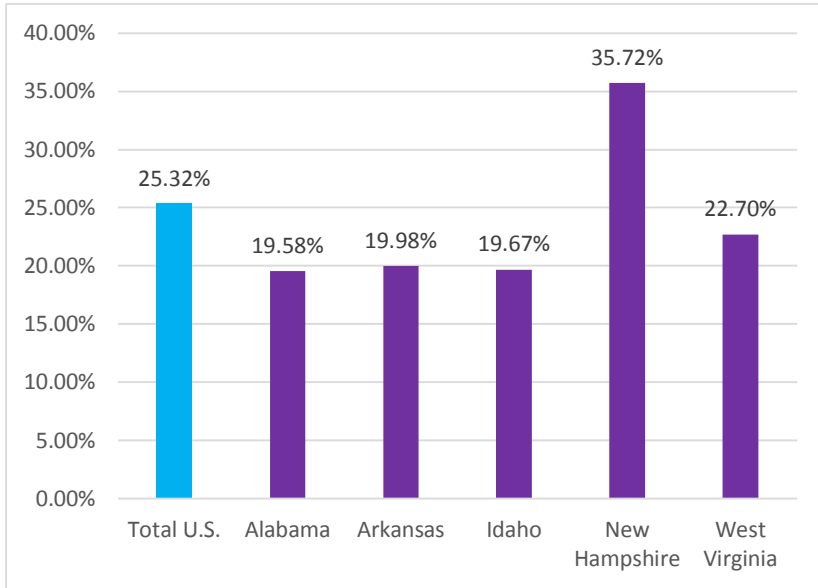
## ANALYSIS RESULTS

### Current Trends in Alcohol Use and Binge Drinking



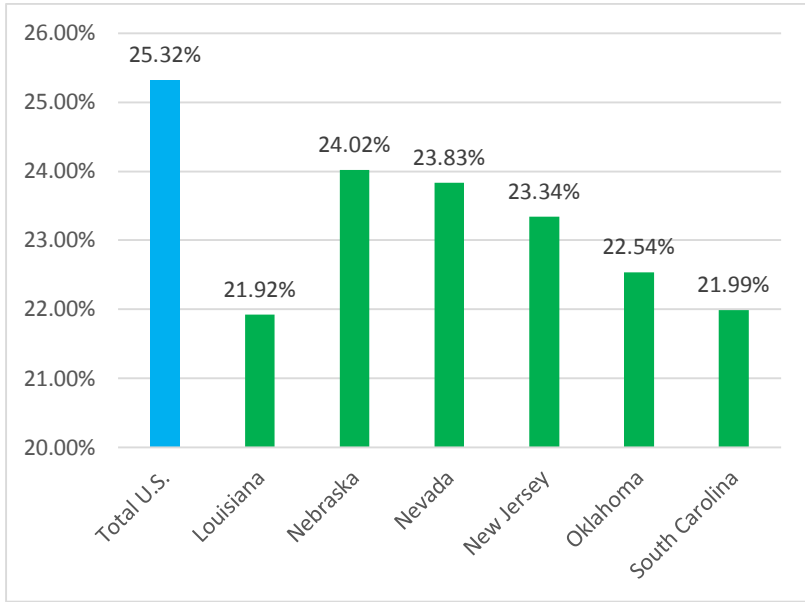
**Figure 2: National average versus selected typical state averages of underage alcohol use in the past month, 2013 NSDUH Data.**

Figure 2 compares underage alcohol use in the last month for the six randomly selected typical states with the US average for 2013. Most of the selected states are below the national average with the exception of Michigan and Pennsylvania. A t-test shows the combined average of the selected typical states were significantly less than the US average ( $p=.000$ ).



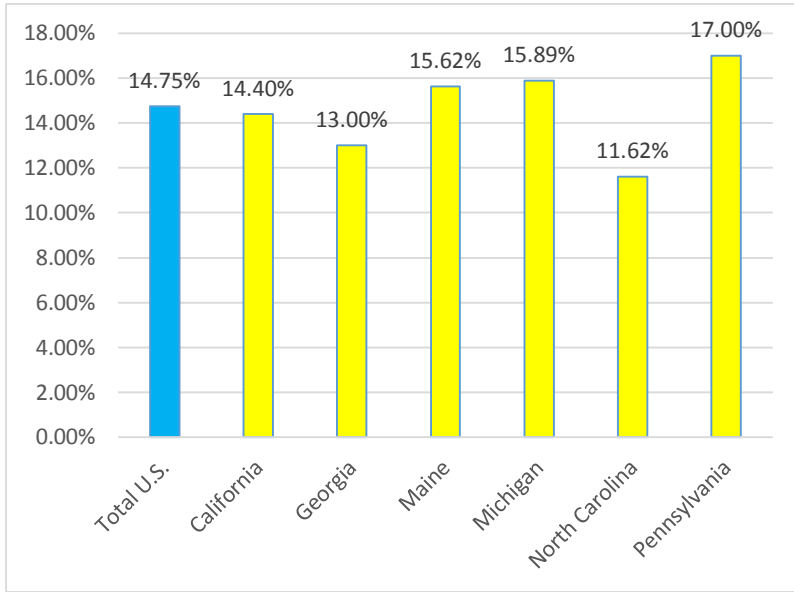
**Figure 3: National average versus strict state averages of underage alcohol use in the past month, 2013 NSDUH Data.**

Figure 3 compares underage alcohol use in the last month for the strict states with the US average for 2013. Most states were below the national average, except for New Hampshire, which was much higher. A t-test did not indicate a significant difference between the US average and the combined average of the strict states ( $p > .05$ ).



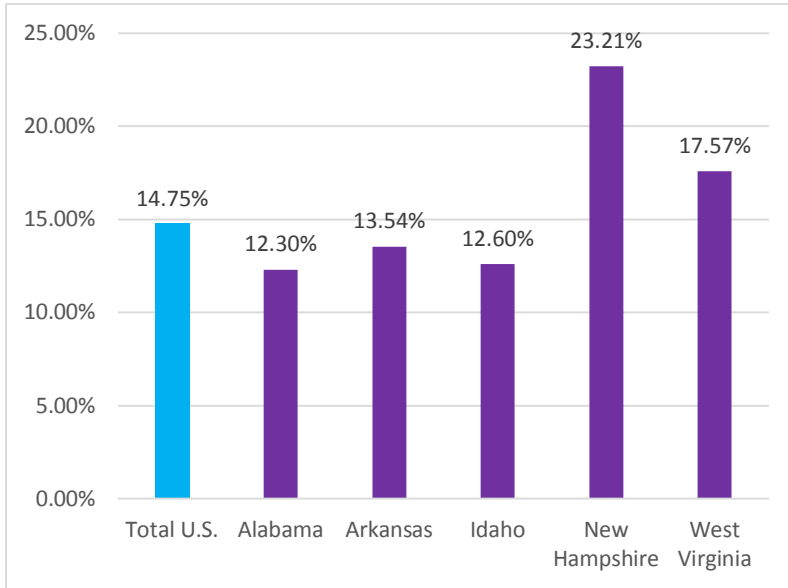
**Figure 4: National average versus lax state averages of underage alcohol use in the past month, 2013 NSDUH Data.**

Figure 4 compares underage alcohol use in the last month for the lax states with the US average for 2013. Underage alcohol use was lower than the national average in all of the lax states. A t-test shows that the combined average of the lax states was significantly lower than national average.



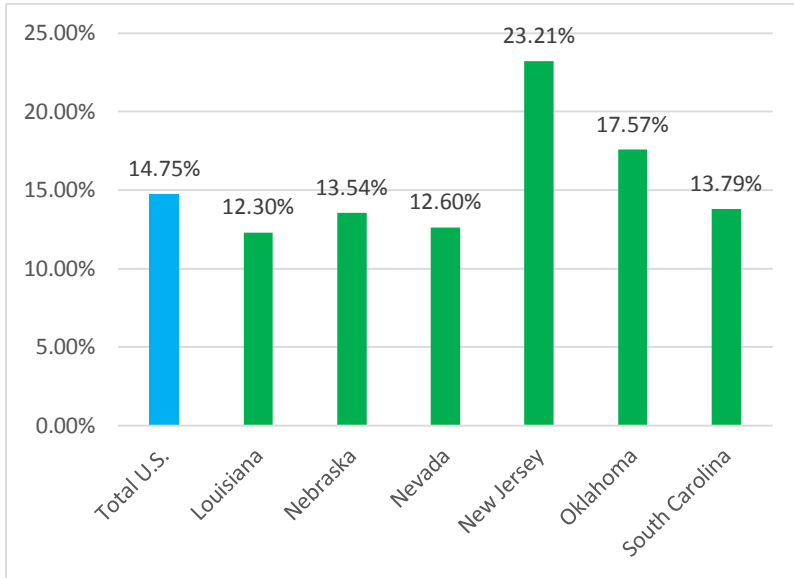
**Figure 5: National average versus selected typical state averages of underage binge drinking in the past month, 2013 NSDUH Data.**

Figure 5 compares the binge drinking averages of the 6 randomly selected typical states with the national average for 2013. Most of the typical states are close to the national average with the exception of North Carolina, which is about 3 percent higher and Pennsylvania which is 2.5 percent higher. A two-tailed t-test comparing the US average with the combined average of the typical states was not significant ( $p > .05$ ). This suggests that there is no significant difference in binge drinking rates between the selected typical states and the US average.



**Figure 6: National average versus strict state averages of underage alcohol use in the past month, 2013 NSDUH Data.**

Figure 6 compares the binge drinking averages of the 5 strict states with the national average for 2013. Three strict states are slightly lower than the national average. West Virginia is about 3 percent higher and New Hampshire is nearly 10 percent higher. A t-test comparing the combined average of the strict states with US strict states average to be higher than the national average, although the results were only borderline significant ( $p=.06$ ).

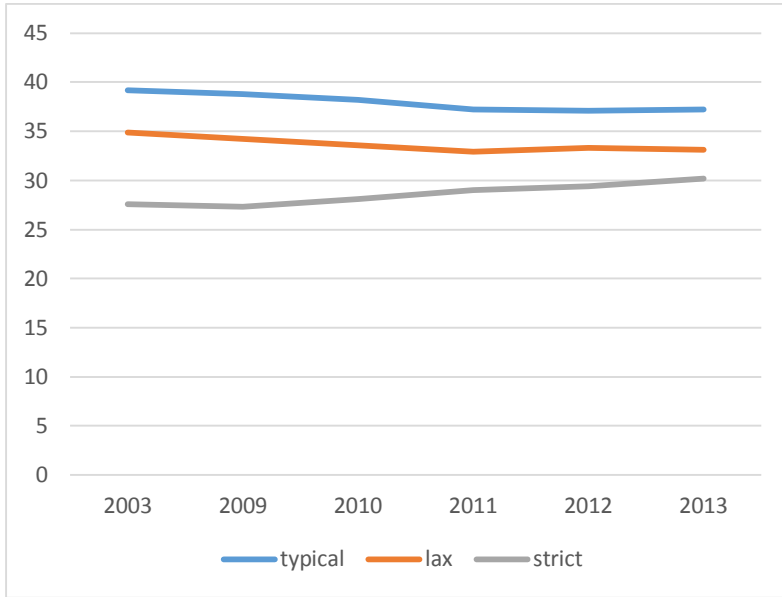


**Figure 7. National average versus lax state averages of underage binge drinking in the past month, 2013 NSDUH Data.**

Figure 7 compares the binge drinking averages of the 6 lax states with the national average for 2013. Three lax states are slightly lower than the national average. Four states, Louisiana, Nebraska, Oklahoma and South Carolina fall beneath the national average. Oklahoma is about 3 percent higher and New Jersey is almost ten percent higher. A t-test comparing the combined average of the lax states with US national average did not indicate a significant difference.

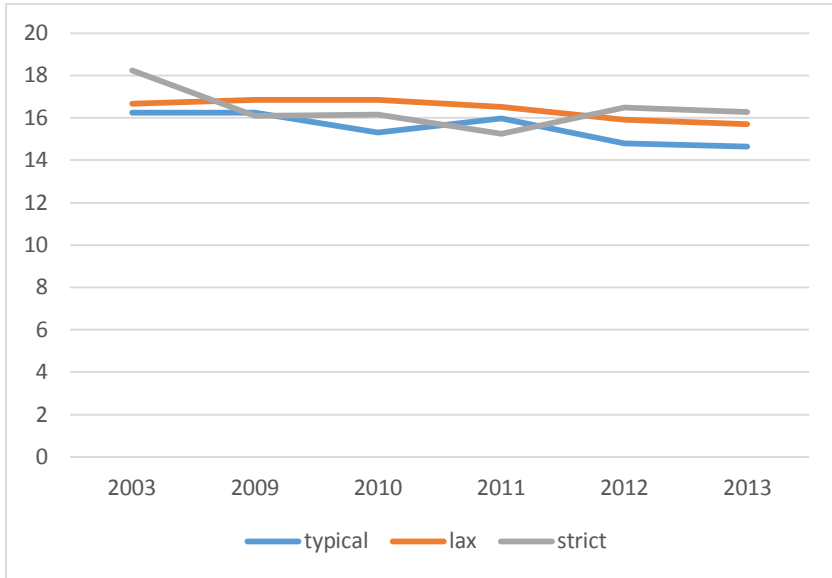
### Temporal Trends in Underage Alcohol Use and Binge Drinking

Next, temporal trends of underage drinking were analyzed between 2003 and 2013 by state type, using time series charts. Please note some years are missing because NSDUH would not allow access to this data. Nonetheless some patterns still can be discerned.



**Figure 8: Underage alcohol use by state type in past month, 2003-2013 NSDUH Data.**

Figure 8 shows the changes in percentages of 12-20 year olds who indicated having consumed alcohol in the previous month from 2003-2013. Alcohol use initially was higher in the typical states and much lower in strict states; however, the data indicate a convergence of rates over time. This is due to decreased alcohol use in the typical and strict states and increased use in the strict states.



**Figure 9: Underage binge drinking by state type in past month, 2003-2013 NSDUH Data.**

Figure 9 shows the changes in percentages of 12-20 year olds who indicated binge drinking behavior from 2003-2013. Binge drinking initially was higher in the strict states and a bit lower in typical and lax states. Binge drinking declined in the strict states from 2009-2011, but appears to be rebounding. Binge drinking appears to be declining slightly over time in the typical and lax states.

### Logistic Regression Analysis Results

Table 1 shows the odds ratios from the logistic regression of underage alcohol consumption one month prior to the survey on the independent variables. The results do not indicate that underage drinking is more likely to occur in lax and strict states versus typical states controlling for year, as the p value is greater than .05. The data indicated, however, that the likelihood of underage drinking has declined over time. With each passing year, 12 to 20-year-olds were only .898 times as likely to have consumed alcohol in the previous month then in the previous year, controlling for state type.



*Table 1: Odds ratios from logistic regression of underage alcohol use in previous month on state-level deterrence and year (p-values in parentheses).*

Variable	Results
Lax State	1.05 (.383)
Strict State	1.06 (.459)
Year	.898 (.000)
N	5,937

Table 2 shows the odds ratios from the logistic regression of underage binge drinking on the independent variables. The results do not indicate a greater likelihood of binge drinking in either the lax and strict states versus typical states, controlling for year as the p value is greater than .05. The data indicate, however, that the likelihood of underage drinking has declined over time, controlling for state-type. With each passing year, 12 to 20-year-olds were only .901 times as likely to have binged drink in the previous month than in the previous year.

*Table 2: Odds ratios from logistic regression of underage binge drinking on state-level deterrence and year (p-values in parentheses).*

Variable	Results
Lax State	1.01 (.096)
Strict State	1.03 (.775)
Year	.901 (.000)
N	5,926

## DISCUSSION

The analysis of self-reported data supports a conclusion that differences in alcohol legislation do not necessarily indicate a change in rates of underage consumption. Classical deterrence and rational choice theories would predict fewer underage drinkers when harsher sanctions are imposed which is not supported by the findings of this research (Mosher & Akins, 2014). Results of a study by Lipperman-Kreda, et al (2010). suggest that personal drinking beliefs may mediate the relationships of community norms about adolescents' alcohol use.. Local enforcement of underage drinking laws may allow for a community norm that supports underage drinking with levels of enforcement that do not coincide with the current legislation, which may be a limitation of this project. Social learning theory could explain the lack of significant variation among states with lax, moderate, and strict policies regarding legal minimum drinking age. Social learning theory would support a lack of recognized deviance in the act that supersedes its actual criminality. If present, this variable would vary greatly among jurisdictions. This view is supported by an Australian study in which high risk youth who lacked protective factors such as community

attachment, school opportunities for prosocial involvement, family attachment, and social skill (Stockwell et al., 2004). A cross-sectional analysis of youth in the study found that 67.1% of binge drinkers fell within the average risk category with only 4.3% categorized at high risk (Stockwell et al., 2004). Further research is needed to identify causal factors in underage alcohol use, but our findings show no significant differences between states that have legislation that allows for underage drinking on private property with no parental permission required versus those who provide absolutely no exception to the minimum drinking age and rates of underage consumption or bingeing. The results of this research therefore challenge the efficacy of minimum legal drinking age legislation as a solution to the societal harms created by the act. Without further inquiry, one must address the notion that if criminalizing underage drinking may not be the most effective control of underage alcohol consumption.

## LIMITATIONS

The results of this study are preliminary and limited due to the fact that NSDUH restricted my access to the data. NSDUH only allows access to the complete data once a year to a limited number of researchers based on competitive research proposals. I plan to submit a proposal when the window opens again later this year, so I can conduct more sophisticated analyses with control variables such as gender and race and ethnicity.

## ACKNOWLEDGEMENTS

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