Binge Drinking and Behavior: Non-Standard Preferences and Decision-Making among College Students

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Abstract

This paper lays out an experimental foundation for investigating the question of what contributes to alcohol consumption behavior. I provide an analysis of current empirical evidence of drinking behavior as well as operational definitions of various traits thought to be associated with drinking behavior. I discuss current theory surrounding non-standard preferences and their application to decision theory in the context of the choice to consume alcohol. These definitions are transitioned into an experimental setting that served as a pilot study for future measures of predictors of drinking behavior. The major contribution of this paper is investigating preferences and their addition to the literature on alcohol consumption. Specifically, I found that risk aversion was negatively correlated with drinking behavior and that exogenous learning was a strong predictor of drinking consequences.

Introduction and Literature Review

What makes binge drinking so popular among college students? Binge drinking in college students is a serious public health concern. Johnston, O’Malley, Bachman and Schulenberg (2010) found that 23% of college students are frequent binge drinkers and 44% of college students had reported binge drinking in the two weeks prior to the study (where binge drinking is defined as drinking 4 or more [females] or 5 or more [males] drinks within a two-hour sitting; Weschler et al., 2000). In addition to a number of consequences (e.g., assault, vocational, and school difficulties, risk for future alcohol dependence), drinking has been shown to result in fatalities (Hingson, Heeren, Winter, & Wechsler, 2005; Jackson, Sher & Park, 2004). According to the Center for Disease Control (2010), cirrhosis of the liver resulting from excessive drinking is the 13th leading
cause of death in the U.S., slightly higher than Parkinson’s disease. Similarly, Cirrhosis of the liver is one of the only causes of death that has consistently increased in prevalence over the past ten years (CDC, 2010). Thus, understanding the factors that predispose individuals to consume alcohol in dangerous amounts is of integral importance to health providers. To this end, I operationalize a series of exogenous traits and endogenous choices hypothesized to correlate with drinking to determine what traits predispose individuals to risky drinking behavior.

One benefit of employing behavioral measures is that they are implicit. Other studies have employed explicit measures to investigate non-standard preferences in the context of drinking behavior (Fletcher 2012; Park et al. 2009). One major downfall of such measurements is whether they are a true reflection of exogenous factors. It is possible that individual’s conscious reports of various personality traits are different from the manifestation of those traits in a choice context. Besides this, a number of sources have pointed to underreporting of drinking behavior in widely used survey instruments (Northcote & Livingston 2011; Duffy & Waterto 1984; Stockwell et al. 2004). Thus, an implicit measure that could accurately detect at-risk individuals could be an invaluable tool for health providers. Specifically, implicit measures offer the benefit of measuring traits without making the measurement conscious to the participant. Thus, implicit measures avoid social desirability effects which have been shown to be an issue in drinking surveys (Northcote & Livingston, 2011). To this end, this study contributes to the literature by employing implicit measures of exogenous traits as well as identifying factors that correlate with risky drinking among college age students.
In the context of rational decision theory, little explanation exists for why an individual would choose to become addicted; previous theoretical models have employed non-standard preferences and assumptions to describe the choice to consume alcohol (Becker & Murphy, 1988; Tomer, 2001). Dellavigna (2009) addresses this issue by recognizing that empirical findings and the results of behavioral games are inconsistent with predictions made by game theory about the behavior of a rational individual. He concludes that current models oversimplify the heterogeneity of individuals and their cost-benefit analysis. To truly grasp the behavior of individuals, Dellavigna (2009) suggests that non-standard preferences and beliefs need to be tested further. Thus, this study seeks to investigate individual preferences and their relationship with drinking behavior.

To this end, Becker and Murphy (1988) attempt to model alcohol consumption through the application of their weak rationality model. They propose the choice to consume addictive goods as well as increase their consumption over time depends largely on time preference and previous levels of consumption. Specifically, the authors conclude that as one becomes more present oriented they evaluate the benefits of drinking to be higher relative to the delayed costs. Vuchinich and Simpson (1998) tested this theory empirically, and found time preference influences how individuals evaluate the costs of drinking. Although Becker and Murphy (1988) cite time preferences as the only exogenous driver of the choice to drink, other research points to the importance of other personality traits.

To expand upon the work of Becker and Murphy (1988), Ida and Goto (2009) investigated time preferences, risk aversion, and drinking behavior. In support of Becker
and Murphy’s original model, Ida and Goto (2009) found that as time preference increases, so that an individual becomes more present-oriented and discounts more steeply, so does risky drinking behavior. In an extension of the original model, Ida and Goto (2009) also find a strong negative correlation between risk aversion and drinking behavior. Ida and Goto (2009) conclude that in the context of decision theory, this finding makes intuitive sense in that individuals that are more risk averse would be more worried about the negative consequences of drinking, and as a result would be more likely to abstain from drinking.

Besides these personality traits, empirical studies have found learning to positively correlate with drinking behavior (Johnston et al. 2010). Using a fixed effects approach, Fletcher (2012) found that presence of alcohol in the home and parental drinking were strong predictors of future alcoholic consumption. Becker and Murphy (1988) modeled the effect of exogenous learning on drinking behavior through consumption capital. Specifically, they assumed that learning increases the benefit of consumption by reducing uncertainty relative to risks while reducing the costs associated with acquiring and consuming addictive goods. Thus, I chose to investigate the correlation between learning, measured through parental drinking, and alcohol consumption among college students.

Finally, empirical evidence points to the significance of certain social groups as correlates of college drinking behavior. Park et al. (2009) found that being a member of a fraternity or sorority group was positively correlated with risky drinking behavior. Building off this work, Huchting et al. (2011) compared drinking behavior in student athletes with fraternity members and found that being a student athlete predicted more
alcohol consumption than being a fraternity member. Thus, I chose to measure group identity to determine its correlation with drinking behavior as well as exogenous traits. In the context of decision theory, Tomer (2001) describes a model in which drinking can be used to increase social capital. In the socioeconomic model, consumers may reap benefits from consumption of addictive goods through its effect on social and personal capital. Tomer (2001) describes a model, backed by psychological evidence, in which consumers may have increased benefits from drinking through either impressing their peers and thus increasing their social capital or feeling better about themselves through their peers’ impressions and thus increasing personal capital.

Thus, this study seeks to investigate preferences and beliefs in the context of alcohol consumption. Specifically, I attempted to determine which preferences (time, risk, peer opinion, etc.) are strongly correlated with non-standard drinking preferences. This study employed a number of experimental games and survey instruments to address the different mechanisms associated with risky drinking behavior. I incorporated these measures with an investigation of social groups on campus to see how these different mechanisms manifest in different social groups. I found that risk aversion was negatively correlated with drinking behavior and its consequences, exogenous learning was negatively correlated with consequences but positively correlated with drinking behavior and that being a student athlete predicted a significant increase in alcohol consumption.

Survey and Experimental Design

Procedure

The first component of the experiment had participants complete a series of games designed to measure various personality and decision-making traits. From there, they
complett questionnaires relating to their drinking history, their parent’s drinking history, and their general demographic characteristics. The experiment and survey elicitation takes roughly 40 minutes per subject. Each subject participates in sessions with multiple subjects at once. Participants receive a compensation of at least $15 or $25 per hour (the total amount depended on their choices in some of the games) for their participation. The measures described below include survey instruments and experimental games that are carried out inside of a lab on the Colgate campus. The experimental games are played before the questionnaires are administered but the ordering of the games is randomly determined. At the opening of the study, participants are informed that their choices during the games would affect their compensation.

General questionnaire. Participants first answer demographic questions. The traits I measure are: age, height, weight, gender, class year, living location, class year, and major. I also ask participants to describe the group they identify best with on campus and how strongly they identify with that group (refer to appendix). Group identity strength is measured on a Likert scale based on the work of Robert Sellers (1998).

Heavy drinking of participant and their guardians. Participants’ heavy drinking is assessed by a 6-item survey instrument that asked about individuals’ quantity and frequency of consumption (NIAAA task force on recommended alcohol questions, 2003). The questionnaire asks participants about drinking in two different intervals: one month and one year. Questions at each interval are how much was had on the average drinking day, how often one binge drinks, and how often one has an alcoholic beverage. The
seventh question asks participants to report the most they had ever drunk in one sitting (refer to appendix). Of note, a number of studies have pointed to issues of underreporting in drinking measures. Thus, to reduce this issue a number of methods previously determined to increase accurate reporting of drinking are employed. Specifically, researchers have found that a mix of immediate and delayed questions resulted in more accurate reporting (Stockwell et al. 2004). Thus, I measure drinking behavior at two different intervals. Similarly, other researchers have established that computer assessments are more effective than face-to-face assessments such that computer assessment of drinking is employed in the study (Duffy & Waterto 1984). Finally, empirical evidence points to accurate reporting among light to moderate drinkers compared to heavy drinkers. Thus, I use interval measures to attempt to reduce underreporting among heavy drinkers (Northcote & Livingston 2011). To investigate the possibility that the scale is measuring different dimensions of drinking behavior, principal component analysis was ran on all of the total drinking items. I found that there was one significant component with roughly equal factor loadings on each item so that the scale was left as is for all regressions.

Parental Drinking. Four of the items from the NIAAA questionnaire were adapted to assess parental drinking. These items had the same content as the original questionnaire but only assess drinking behavior in the one-year interval. Two additional questions were created by me: one that measures the frequency of drinking in the presence of a parental figure as well as one that measures the frequency of parental drinking in the presence of the participant (refer to appendix).
Drinking Consequences. Drinking-related consequences are assessed by a 24-item survey instrument with yes/no responses (Kahler, Strong, and Read, 2005). Consequence score is determined by adding the number of yes responses. The scale contains 12 severe and 12 not severe consequences that ranged in their emotional and physical content (refer to appendix). Questions with physical content range from throwing up and experiencing a hangover to sexual assault. Emotional questions range from difficulties with significant others to feeling bad about oneself. Other questions include legal difficulties, regretting actions, and failure to fulfill responsibilities. To investigate the possibility that the consequence scale contained more than one dimension, Principal component analysis was ran on all of the consequence items. The results reflected a lack of variance in one of the items (consequence 22) so that it was dropped from further analysis. No significant interpretation could be found in the rest of the components so that I split the items into severe and not severe based on the original design (Read, Kahler, & Strong, 2006).

Patience. This is measured by an experimental game designed by Holt and Laury (2002). A version of the game was designed by me and includes 1 practice round with instructions to familiarize participants with the game. Each participant experiences two experimental conditions. In the first treatment, participants make eight decisions between an immediate and a delayed reward where the delay is 1 week, and the number of immediate rewards chosen is recorded. The second treatment is identical except that the delay is 4 weeks. In each treatment, the participant makes 8 decisions with a constant immediate reward ($3) and delayed rewards that increase in increments of $1 from $3 to $10.
Risk Aversion. Risk Aversion is assessed through an experimental game with a risky and safe lottery following Holt & Laury (2002), and the game includes instructions with four practice examples to familiarize participants with the game. Participants are randomly assigned to experience either a high stakes or low stakes lottery with ten choices between a safe and a risky lottery in each. In the high stakes condition participants choose between the risky lottery, high pay equal to $13.50 and low pay equal to $0.35, and the safe lottery, high pay equal to $7.00 and $5.60. In the low stakes condition participants choose between the risky lottery, high pay equal to $5.75 and low pay equal to $0.15 and the safe lottery, high pay equal to $3.00 and low pay equal 2.40. In each successive decision, the probability of receiving the high reward increases by ten percent (i.e. in the first decision the probability of receiving the high reward is ten percent and in the second decision it is twenty percent). In concordance with Holt and Laury (2002), the expected values of the two lotteries switch from the safe option having the higher expected value to the risky option having the higher expected value in decision 4. Thus, a risk neutral individual would switch from safe to risky at that point. This serves as a benchmark to identify risk loving (those who switched before decision 4) and risk averse individuals (those who switch after decision 4).

Trust. This is assessed through a standard trust game whose design is based on the Handbook of Experimental Economics (Kagel & Roth, 1995). I use a variation of this game that allows a treatment providing individuals with information about the average contribution of the group in a previous round of the game. Instructions are presented to the participants to familiarize them with the game. Each round of the trust game involves the first player (the proposer) choosing an amount of money out of his or her total
endowment of $8.00 to give to a second player (the responder). The first player’s investment is then increased by a factor of 1.5 and the second player chooses an amount of money they wish to return to the first player for their investment. The treatments vary in the knowledge about the participants’ donations (i.e. how much participants passed in previous rounds). Each participant experiences one control round followed by a control or a treatment round that is randomly determined. Treatment rounds involve providing information about the average passing of providers and responders.

*Altruism and Susceptibility to Peer Pressure.*

This trait is assessed through a standard public goods game whose design is based on the Handbook of Experimental Economics (Kagel & Roth, 1995). Instructions are first provided such that participants could become familiar with the procedure. In this game, participants choose whether or not to donate to a public good which offers a fractional return to them as well as other participants based on others’ choices. Each participant receives 50 tokens at the start of the game and is informed that keeping the tokens provides an internal return of 0.10 while donating them provides an external and an internal return of 0.05. Each participant experiences one round of practice to familiarize themselves with the procedure and establish a baseline, followed by an experimental round in which information about peers’ average donations was provided. Susceptibility to peer pressure is measured as the difference in the subject’s donation and the peer’s average donation relative to the first round.

*Data*

**Table 1: Demographics**

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Mean /proportion</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of immediate choices at one week</td>
<td>1.640</td>
<td>1.086</td>
<td>75</td>
</tr>
<tr>
<td>Number of immediate choices at four weeks</td>
<td>3.067</td>
<td>2.189</td>
<td>75</td>
</tr>
<tr>
<td>Provider pass</td>
<td>4.056</td>
<td>2.937</td>
<td>36</td>
</tr>
<tr>
<td>Responder reciprocation</td>
<td>2.000</td>
<td>2.599</td>
<td>38</td>
</tr>
<tr>
<td>Donations to the public good</td>
<td>12.507</td>
<td>14.756</td>
<td>67</td>
</tr>
<tr>
<td>Number of safe lottery choices</td>
<td>5.307</td>
<td>1.793</td>
<td>75</td>
</tr>
<tr>
<td>Low stakes</td>
<td>5.368</td>
<td>1.895</td>
<td>38</td>
</tr>
<tr>
<td>High Stakes</td>
<td>5.243</td>
<td>1.706</td>
<td>37</td>
</tr>
<tr>
<td>Econ Major</td>
<td>0.467</td>
<td>0.502</td>
<td>75</td>
</tr>
<tr>
<td>Fraternity member</td>
<td>0.187</td>
<td>0.392</td>
<td>75</td>
</tr>
<tr>
<td>Sports team member</td>
<td>0.320</td>
<td>0.470</td>
<td>75</td>
</tr>
<tr>
<td>Other Group</td>
<td>0.493</td>
<td>0.503</td>
<td>75</td>
</tr>
<tr>
<td>Binge drinkers</td>
<td>0.613</td>
<td>0.490</td>
<td>75</td>
</tr>
<tr>
<td>Age</td>
<td>19.880</td>
<td>1.414</td>
<td>75</td>
</tr>
<tr>
<td>Legal drinkers</td>
<td>0.307</td>
<td>0.464</td>
<td>75</td>
</tr>
<tr>
<td>Female</td>
<td>0.400</td>
<td>0.493</td>
<td>75</td>
</tr>
<tr>
<td>Number of consequences experienced</td>
<td>14.96</td>
<td>5.305</td>
<td>75</td>
</tr>
<tr>
<td>Severe</td>
<td>8.733</td>
<td>2.601</td>
<td>75</td>
</tr>
<tr>
<td>Not severe</td>
<td>6.227</td>
<td>3.216</td>
<td>75</td>
</tr>
<tr>
<td>Events Ratio</td>
<td>1.093</td>
<td>1.295</td>
<td>74</td>
</tr>
<tr>
<td>Fraternity Members</td>
<td>0.603</td>
<td>0.249</td>
<td>14</td>
</tr>
<tr>
<td>Sports Members</td>
<td>1.187</td>
<td>1.396</td>
<td>24</td>
</tr>
<tr>
<td>Other Members</td>
<td>1.221</td>
<td>1.440</td>
<td>37</td>
</tr>
</tbody>
</table>

The data consists of 75 participants from a small liberal arts college, 30 are female and 35 are male with an average age of 19.9 years (std. error: 1.41), thus only 23 of the participants can legally consume alcohol. By class year, there are 26 freshman, 21 sophomores, 11 juniors, and 19 seniors representing a good sample of class years. In the case of group identity, 14 participants identify as fraternity/sorority members, 8 participants identify as musical group members, 24 members identify as sports team members, 4 participants identify as theater group members, and 1 participant identify strongly with a volunteer group. In general, the sample contains 24 double majors, 29
natural science majors, 17 humanities majors, and 3 participants who are undeclared. Of note, no delineation is made between prospective and official majors. There are also a disproportionate number of economics majors (n=35) among the social science category.

**Group Identity and events ratio**

Group identity is adapted from the work of Robert Sellers (2002), and is assessed as the sum of a number of items. On average, participants report strong group identities with the average participant choosing a group identity higher than the median point. The average group events ratio reflects that on average participants attend slightly more non-alcoholic events with their group than alcoholic events, but the proportions are relatively close (1.093 ≈ 1.000).

**Drinking**

A total drinking score is calculated as the sum of all of the drinking behavior questions. Binge drinking is based on the APA’s current definition of 5(4) drinks for males(females) in a two-hour period and a participant is coded as a binge drinker if they binge drink at least once a week. In the case of binge drinking, 46 participants binge drink at least once a week, a much higher proportion than previous studies (61 versus 44%) (Johnston, O'Malley, Bachman, & Schulenberg, 2010).

**Exogenous Learning**

Exogenous learning is operationalized by three different measures: A total amount of parental drinking as measured through the adapted NIAAA questions, frequency of drinking in the presence of a parent, and frequency of parent drinking in front of the participant. Participants report having parents who drink roughly 1-3 times a week and
have on average 2 drinks per sitting. Less than half of the participants report ever witnessing their parents binge drink. Participants report witnessing parental drinking an average of once a week and the average report of drinking in front of one’s parents is much lower, roughly less than once a month.

**Consequences**

On average, participants experience 8.04 of the full 23 negative consequences. The severe category contains 11 items reflecting that on average participants experience 2.267 severe negative consequences. The non-severe category contains 12 items reflecting that on average participants experience 5.773 not severe negative consequences of drinking. The finding that participants experience more non-severe than severe consequences on average is consistent with the initial test of the scale (Read, Kahler, & Strong, 2006).

**Behavioral results**

Risk aversion is measured as the number of safe choices made out of the possible ten lottery decisions. In concordance with the original study (Holt & Laury, 2002), the expected values of the two lotteries switch in decision four so that participants that made less than four safe choices are risk loving, those that made four safe choices are risk neutral, and those that made more than four choice are risk averse. In terms of risk aversion, 46 participants are risk averse, 19 are risk neutral, and 10 are risk loving. The proportion of risk averse participants is slightly lower than in previous samples (Holt & Laury, 2002). Similarly, an F-test conducted on the high and low stakes condition found no significant difference in risk aversion; a finding that contradicts the original research which found a positive correlation between stakes and risk aversion (Holt & Laury, 2002).
Patience is measured as the number immediate choices made out of the possible eight options in the temporal game. Specifically, the lower the number of immediate choices made, the more patient a participant is considered to be. A participant who chooses one immediate reward is considered to be perfectly patient (they are only driven by higher rewards). In the context of patience, 44 participants exhibit perfect patience at a delay of one week, 27 participants exhibit perfect patience at a delay of 4 weeks, and 37 participants reflect no difference in patience between a delay of 1 and 4 weeks.

Altruistic giving is defined as donation in the public goods game. In the context of altruistic giving, participants give an average of 13 tokens (14.8), which is roughly 25% of their total endowment. This is lower than previous research, which found average donations between 40% and 60% (Holt, 2006; Ledyard, 1995). In terms of rationality, this finding provides some evidence that my sample contained more rational individuals than previous research, as the rational choice in the public goods scenario is to donate nothing.

In concordance with the original design (Berg, Dickhaut, & McCabe, 2005), Generalized trust is measured to be the amount invested by providers in the trust game while reciprocity was measured as the amount returned by responders. In terms of trust and reciprocity, participants pass an average of 4.06 (about half of their endowment) and are returned an average of 2 (about one-third of the responders total). This is consistent with the original trust game results (Berg, Dickhaut, and McCabe, 2005). This reflects a fault in participant rationality in that the responders should not return any investments and providers should pass none of their endowment by recognizing that responders should not return any of their investment. Thus, this result reflects non-standard decision
making as participants passed and returned investments even though their incentives were not to.

Peer pressure is measured as a difference in public good donations between round 1 and round 2 that is closer to the reported average. Specifically, a dummy variable for peer pressure is constructed by assigning a participant a 1 if they donate an amount to the public good that was closer to the peer average in round 2 compared to round 1. In the sample, 10 participants are found to be susceptible to peer pressure. One thing that should be noted here is that it is possible that some amount of the susceptibility to peer pressure measure could also be explained by learning between round 1 and round 2.

In some ways, my findings are consistent with previous work; specifically, the results of the trust game are consistent with the original experiment. However, there are elements of my sample that are unusual. In the context of external validity, there is less risk aversion than in previous studies, lower altruistic giving, and higher binge drinking. In the context of internal validity, less than half of the varsity sports on campus are represented in the sample, and the same is true among fraternity members. There are a significant number of the economics majors whose previous knowledge of game theory may have threatened the implicitness of the behavioral measures.

Results

Sampling Issues

Table 2: Differences between sessions

Note: legal is a dummy that takes on a value of 1 if the participant is over 21 years of age. Female is a dummy that takes on value of one if the participant was a female. BMI, or body mass index, represents a measure of height and weight. Order is a variable that
takes on values from 1 to 4 representing the presentation of the game. Econ, frat and sports are group dummies that take on a value of one if the participant was a member of that group. * denotes a significance at the $P<.1$ level, ** denotes significance at the $P<.05$ level, *** denotes significance at the $P<.01$ level.

Example of the model: \[ \text{Risk aversion} = \beta_0 + \beta_1 \text{Legal} + \beta_2 \text{Female} + \beta_3 \text{BMI} + \beta_4 \text{Order} + \beta_5 \text{Econ} + \beta_6 \text{Frat} + \beta_7 \text{Sports} + \beta_8 \text{GroupA} + \varepsilon \]

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Risk Aversion</th>
<th>Public Good</th>
<th>Patience1</th>
<th>Patience4</th>
<th>Trust</th>
<th>Total Drinks</th>
<th>Consequence Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>GroupA</td>
<td>1.475**</td>
<td>0.449</td>
<td>1.261</td>
<td>-0.369</td>
<td>6.656*</td>
<td>1.642</td>
<td>(0.698)</td>
</tr>
<tr>
<td>GroupB</td>
<td>0.147</td>
<td>-17.669*</td>
<td>0.429</td>
<td>0.219</td>
<td>1.689</td>
<td>5.186</td>
<td>(0.945)</td>
</tr>
<tr>
<td>GroupC</td>
<td>0.982*</td>
<td>-2.445</td>
<td>0.644*</td>
<td>0.631</td>
<td>1.123</td>
<td>2.794</td>
<td>(0.550)</td>
</tr>
<tr>
<td>GroupD</td>
<td>-0.088</td>
<td>19.494**</td>
<td>-0.618</td>
<td>-2.005**</td>
<td>-1.994</td>
<td>-3.213</td>
<td>(0.752)</td>
</tr>
<tr>
<td>GroupE</td>
<td>-1.591**</td>
<td>-1.169</td>
<td>-0.216</td>
<td>-1.096</td>
<td>0.223</td>
<td>-3.855</td>
<td>(0.786)</td>
</tr>
<tr>
<td>GroupF</td>
<td>-1.088</td>
<td>12.949*</td>
<td>-0.406</td>
<td>0.554</td>
<td>-0.264</td>
<td>1.727</td>
<td>(0.848)</td>
</tr>
<tr>
<td>GroupG</td>
<td>-0.735</td>
<td>-7.621</td>
<td>0.196</td>
<td>-1.407</td>
<td>2.074</td>
<td>3.566</td>
<td>(0.661)</td>
</tr>
<tr>
<td>GroupH</td>
<td>1.412*</td>
<td>0.510</td>
<td>0.010</td>
<td>0.280</td>
<td>0.781</td>
<td>-1.895</td>
<td>(0.838)</td>
</tr>
<tr>
<td>GroupI</td>
<td>-0.032</td>
<td>1.465</td>
<td>-0.167</td>
<td>2.380***</td>
<td>-2.326</td>
<td>-2.418</td>
<td>(0.800)</td>
</tr>
</tbody>
</table>

To determine if there are any significant differences between the sessions, a regression is run on each of the group dummies with behavioral measures as the explanatory variables.

The logic behind this is that sessions were run at various times of the day as well as during different days of the week such that systematic differences could contribute to the results of any group. Once age, gender, physical characteristics, order of presentation of the conditions and group makeup are controlled for, some of the groups still significantly correlated with the behavioral measures. Of note, when the total drinks regression is run
with risk aversion, the significance of Group A drops out. Similarly, the same result occurs for consequence total when risk aversion is included for the Group C regression. In the rest of the cases, it is likely that these groups have some underlying differences, which are unobserved, but since the dummies are uncorrelated with our dependent measures of interest, I choose not to include them as controls in later regressions. However, in each of the regressions of interest standard errors are clustered at the session level to produce more robust standard errors.

Selection Bias

Table 3: Estimating the effect of compensation

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Dependent Variable</th>
<th>Dependent Variable</th>
<th>Dependent Variable</th>
<th>Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Drinks</td>
<td>Consequences Total</td>
<td>Consequences not severe</td>
<td>Consequences severe</td>
</tr>
<tr>
<td>Legal</td>
<td>-1.137 (2.698)</td>
<td>-2.240 (1.343)</td>
<td>-0.771 (0.794)</td>
<td>-1.414** (0.702)</td>
</tr>
<tr>
<td>Bmi</td>
<td>-0.124 (0.381)</td>
<td>0.213 (0.190)</td>
<td>0.131 (0.112)</td>
<td>0.081 (0.099)</td>
</tr>
<tr>
<td>Female</td>
<td>7.359*** (2.542)</td>
<td>2.829** (1.266)</td>
<td>1.951** (0.748)</td>
<td>0.824 (0.661)</td>
</tr>
<tr>
<td>Exogenous Learning</td>
<td>1.861*** (0.629)</td>
<td>0.931*** (0.313)</td>
<td>0.453** (0.185)</td>
<td>0.441 (0.164)</td>
</tr>
<tr>
<td>Compensation</td>
<td>-0.785 (2.557)</td>
<td>-1.938 (1.273)</td>
<td>-1.513 (0.752)</td>
<td>-0.480 (0.665)</td>
</tr>
<tr>
<td>N</td>
<td>61</td>
<td>61</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>R-sq</td>
<td>0.2699</td>
<td>0.2898</td>
<td>0.2630</td>
<td>0.2393</td>
</tr>
<tr>
<td>Adj. R-sq</td>
<td>0.2035</td>
<td>0.2252</td>
<td>0.1960</td>
<td>0.1701</td>
</tr>
</tbody>
</table>

Note: compensation is a dummy variable that takes on a value of 1 if the participant was compensated with $25

Example of the model: \( \text{Total Drinks} = \beta_0 + \beta_1 \text{Legal} + \beta_2 \text{Female} + \beta_3 \text{BMI} + \beta_4 \text{Drinking in the presence of a parent} + \beta_5 \text{compensation} + \varepsilon \)

One potential issue is that the compensation being offered for the study resulted in a selection bias of participants who were driven by a reward of $15. Luckily, in the later weeks of the experiment compensation was increased to increase recruiting to $25. This
provided a natural way to test if compensation affected the profile of participants in the sample. In regressions using the dependent variables of interest and compensation as well as controls as the independent variables, compensation fails to be significant providing evidence that the sample of students recruited from offering $15 was not significantly different from the group of students sampled from offering $25.

**Potential Fatigue effect**

**Table 4: Order of presentation**

<table>
<thead>
<tr>
<th>Exploratory</th>
<th>Dependent</th>
<th>Dependent</th>
<th>Dependent</th>
<th>Dependent</th>
<th>Dependent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Risk Aversion</td>
<td>Public Good</td>
<td>Patience1</td>
<td>Patience4</td>
<td>Trust</td>
</tr>
<tr>
<td>Legal</td>
<td>-0.123 (0.458)</td>
<td>3.105 (4.149)</td>
<td>0.206 (0.278)</td>
<td>-0.370 (0.527)</td>
<td>1.215 (1.133)</td>
</tr>
<tr>
<td>Gender</td>
<td>0.609 (0.439)</td>
<td>-0.750 (3.812)</td>
<td>0.034 (0.261)</td>
<td>1.435*** (0.494)</td>
<td>-2.384** (0.937)</td>
</tr>
<tr>
<td>Order</td>
<td>-0.087 (0.185)</td>
<td>0.351 (1.713)</td>
<td>-0.010 (0.161)</td>
<td>-0.288 (0.306)</td>
<td>0.217 (0.428)</td>
</tr>
<tr>
<td>N</td>
<td>75</td>
<td>67</td>
<td>75</td>
<td>75</td>
<td>36</td>
</tr>
<tr>
<td>R-sq</td>
<td>0.0373</td>
<td>0.0090</td>
<td>0.0080</td>
<td>0.1247</td>
<td>0.1952</td>
</tr>
<tr>
<td>Adj R-sq</td>
<td>-0.0034</td>
<td>-0.0382</td>
<td>-0.0339</td>
<td>0.0878</td>
<td>0.1197</td>
</tr>
</tbody>
</table>

*Note: order represents the presentation of the game and varies from 1 to 4.*

Example of the model: \( \text{Risk aversion} = \beta_0 + \beta_1 \text{Legal} + \beta_2 \text{Female} + \beta_3 \text{order} + \epsilon \)

Although the order of conditions was randomized as much as possible, I choose to always have the survey be the last portion of the experiment to reduce priming effects. However, this has a cost in that it exposes the survey to potential fatigue effects. The current design does not give anyway to test the existence of such an effect so that discussion of this effect is limited to simply saying that it could be a potential issue in the data.

To investigate a potential fatigue effect in the behavioral games, I regress order of presentation on choices in the respective game. None of the behavioral games find a
significant difference in the order of presentation on choice. Thus, it is unlikely that responses in the behavioral games are the result of fatigue effects or learning from previous games.

*Disproportionate presence of econ majors*

One thing that should be noted is that all of my definitions depend heavily on game theory. The games I use are intended to be explicit methods to measure implicit characteristics, but if a participant is wary of this, he or she may in fact be providing an explicit measure of an explicit characteristic (i.e. how generous we are may be different from how generous we think we are). Thus, being an econ major could make one more knowledgeable of the procedure and as a result more likely to give responses that are consistent with their education and not their own preferences. Thus, regressions are run on all of the experimental measures to see if being an econ major provides any explanatory power on responses to the various conditions. In general when controls were included, being an econ major and coefficients on items interacting being an econ major with the behavioral measures are weak correlates or insignificant providing compelling evidence that being an econ major did not threaten the validity of the measures. However, to guard against this potential issue, regressions include the econ dummy as a control for the behavioral measures.

*Predicting Drinking*

*Total drinking*

*Table 5: total drinking regressions*

*Note: total drinking score and parental drinking score is coded in a way that a higher score reflects lower drinking*
\[ Y = \beta_0 + \beta_1 \text{Econ} + \beta_2 \text{Frat} + \beta_3 \text{Sports} + \beta_4 \text{Drinking in parental presence} + \beta_5 \text{Parental drinking in participant’s presence} + \beta_6 \text{Events ratio} + \beta_{\text{Group id}} \]

Where group represents a matrix of group dummies (Econ, Frat, Sports), Pdrink represents a matrix of the parental drinking variables, and Behavioral represents a matrix of all the traits measured by the games. Events ratio denotes the comparison of the proportion of non-alcoholic to alcoholic events attended and group id represents a measure of how strongly one feels connected to their social group.

In regressions run on total drinking, a number of significant findings that are consistent with previous literature are found. Consistent with
national survey data (Johnston 2010), I found that gender is significantly correlated with total drinking in that being a female is negatively correlated with total drinking. I found that exogenous learning is positively correlated with total drinking; this is consistent with Fletcher (2012) who found that exogenous learning is a significant predictor of drinking behavior. In terms of behavioral measures, only risk aversion is significant but the direction of the relationship was consistent with Ida and Goto (2009). Specifically, as risk aversion increases, total drinking decreases. Building off of the work of Hutchting et al. (2011), I find that being a member of a sports team is significantly positively correlated with total drinking while being a member of a fraternity is also positively correlated with total drinking but not significantly. In an original finding, I find that the proportion of non-alcoholic events attended relative to alcoholic events is negatively correlated with total drinking. This may be viewed as building off Tomer (2001) who concluded that social group demands may predict drinking behavior. Specifically, if a group finds drinking to be more important they may have more events where drinking is present and as a result individuals may drink more to belong. Similar to this argument, strength of group identity is significantly correlated with total drinking. It is possible that as one becomes more strongly identified with a group, they will do more to fit into that group and that may include drinking. In support of this argument, I found that an interaction between fraternity membership and strength of group identity is significant and positively correlated with drinking such that as a participant identifies more strongly with a group the values drinking, they are more likely to drink more. The specific mechanism hypothesized to drive this behavior is discussed further in the discussion section.
Table 6: Regressions on total consequences

Note: consequence total was coded in a way that a higher score reflects less consequences. Specifically, a score of 0 reflects experiencing all 23 consequences while a score of 23 would reflect experiencing zero consequences.

\[ \text{Dependent} = 0 + 1 \times \text{Peer pressure} + 2 \times \text{Explanatory} + 3 \times \text{Dependent} + 4 \times \text{Explanatory} + 5 \times \text{Dependent} + 6 \times \text{Explanatory} + \epsilon \]

Where group represents a matrix of group dummies (Econ, Frat, Sports), Pdrink represents a matrix of the parental drinking variables, and Behavioral represents a matrix of all the traits measured by the games. Events ratio denotes the comparison of the proportion of non-alcoholic to alcoholic events attended and group id represents a measure of how strongly one feels connected to their social group.

<table>
<thead>
<tr>
<th>Dependent</th>
<th>Dependent</th>
<th>Dependent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer pressure</td>
<td>Explanatory</td>
<td>Consequence</td>
</tr>
<tr>
<td>Patience1</td>
<td>Legal</td>
<td>Total</td>
</tr>
<tr>
<td>(0.350)</td>
<td>(0.780)</td>
<td>-10.833**</td>
</tr>
<tr>
<td>Patience4</td>
<td>BMI</td>
<td>0.191</td>
</tr>
<tr>
<td>(0.700)</td>
<td>(0.196)</td>
<td></td>
</tr>
<tr>
<td>Econ1</td>
<td>Gender</td>
<td>2.085</td>
</tr>
<tr>
<td>(0.200)</td>
<td>(1.300)</td>
<td></td>
</tr>
<tr>
<td>Sports1</td>
<td>Parental drinking</td>
<td></td>
</tr>
<tr>
<td>(1.430)</td>
<td>(0.401)</td>
<td></td>
</tr>
<tr>
<td>Drinking</td>
<td>Drinking in parental presence</td>
<td></td>
</tr>
<tr>
<td>(9.430)</td>
<td>(8.686)*</td>
<td></td>
</tr>
<tr>
<td>Parental</td>
<td>Event ratio drinking in</td>
<td></td>
</tr>
<tr>
<td>(0.672)</td>
<td>(0.673)</td>
<td></td>
</tr>
<tr>
<td>Risk Aversion*Legal</td>
<td>Risk Aversion</td>
<td>1.471*</td>
</tr>
<tr>
<td>(1.430)</td>
<td>(0.760)</td>
<td></td>
</tr>
<tr>
<td>R sq</td>
<td>Adj. R sq</td>
<td>0.2019</td>
</tr>
<tr>
<td>(0.200)</td>
<td>(0.190)</td>
<td></td>
</tr>
</tbody>
</table>
In terms of consequences, I find that risk aversion and exogenous learning are significantly related to the number of consequences experienced. The finding with regards to risk aversion is consistent with my expectations; specifically, an increase of one in the number of safe choices made is associated with a decrease of 0.829 in the average number of negative consequences experienced. Ida and Goto (2009) propose a mechanism in which drinking behavior is negatively related to risk aversion. Specifically, as risk aversion increases it is likely that individuals will abstain from drinking to avoid its negative consequences. My results support this hypothesis as when risk aversion increases the number of consequences experienced on average decreases. In an original finding, I find a significant interaction between being of legal age and risk aversion. Specifically, those that are of legal age experience roughly 1.471 less negative consequences following an increase in risk aversion compared to their non-legal counterparts. This evidence may further support the risk aversion hypothesis in that consequences experienced when one is legal are likely more severe (as a result of greater responsibilities) so that it would make intuitive sense that those that are of legal age and are risk averse will experience less negative consequences than their non-legal counterparts. The correlation between exogenous learning and consequences is also unsurprising given the theoretical predictions of Becker and Murphy (1988). Specifically, in their model, Becker and Murphy determine that exogenous learning decreases some of the costs of drinking so that those that learn more are more likely to drink more. In terms of my results, I found that as parental drinking increases and drinking in the presence of
an individual’s parents increases, the number of negative consequences experienced increases. Building off of Becker and Murphy’s (1988) model, this would be the result of higher drinking from lowered costs through exogenous learning. One original finding is that parental drinking in participant presence is negatively related to the total number of consequences experienced. This finding also has bearing on Becker and Murphy’s (1988) original findings in that this may reflect higher utility from consumption through lower costs of unknown consequences.

*Not Severe versus Severe*

**Table 7:** comparison of severe and not-severe consequences

*Note: Both consequence Severe and Not severe were coded so that higher scores reflect lower consequences.*

\[ Y = \beta_0 + \beta_1 P_{\text{drink}} + \beta_2 P_{\text{behavioral}} + \beta_3 P_{\text{group}} + \beta_4 E_{\text{events}} + \beta_5 \text{id} + \epsilon \]

Where group represents a matrix of group dummies (Econ, Frat, Sports), Pdrink represents a matrix of the parental drinking variables, and Behavioral represents a matrix of all the traits measured by the games. Events ratio denotes the comparison of the proportion of non-alcoholic to alcoholic events attended and group id represents a measure of how strongly one feels connected to their social group.
When consequences are separated into severe and not severe, a separation of the predictors of total consequences occurs. Not severe consequences are found to be more prevalent among males and less common among those who had parents who drink less. Severe consequences are negatively related to risk aversion, increase on average as participant drinking in front of their parents increased, and decrease on average as parents drink more in front of the participant. In general, I believe that this split has captured two general mechanisms of drinking: biological and psychological. Specifically, the not severe consequences seem to be related to a biological consumption effect in that males drink more on average than females and that there is a certain degree of heritability in drinking behavior so that in some ways parental drinking level can reflect a biological predisposition to drinking. If this is the case, it is unsurprising that the other factors are

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Consequence Severe</th>
<th>Consequence Not Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal</td>
<td>-0.880</td>
<td>-0.508</td>
</tr>
<tr>
<td>BMI</td>
<td>0.005</td>
<td>0.025</td>
</tr>
<tr>
<td>Gender</td>
<td>0.430</td>
<td>1.643*</td>
</tr>
<tr>
<td>Parental Drinking</td>
<td>0.188</td>
<td>0.275*</td>
</tr>
<tr>
<td>Drinking in parental presence</td>
<td>0.477**</td>
<td>0.365</td>
</tr>
<tr>
<td>Parental drinking in participant’s presence</td>
<td>-0.449**</td>
<td>-0.328</td>
</tr>
<tr>
<td>Risk Aversion</td>
<td>0.433*</td>
<td>0.391</td>
</tr>
<tr>
<td>Public good</td>
<td>-0.020</td>
<td>-0.020</td>
</tr>
<tr>
<td>Peer pressure</td>
<td>0.832</td>
<td>-0.390</td>
</tr>
<tr>
<td>Patience1</td>
<td>-0.028</td>
<td>0.439</td>
</tr>
<tr>
<td>Patience4</td>
<td>-0.127</td>
<td>-0.048</td>
</tr>
<tr>
<td>Econ1</td>
<td>0.737</td>
<td>0.922</td>
</tr>
<tr>
<td>Sports1</td>
<td>-0.081</td>
<td>-1.456</td>
</tr>
<tr>
<td>Frat1</td>
<td>-0.761</td>
<td>-0.536</td>
</tr>
<tr>
<td>Events ratio</td>
<td>0.253</td>
<td>0.417</td>
</tr>
<tr>
<td>Group identity</td>
<td>0.041</td>
<td>-0.052</td>
</tr>
<tr>
<td>N</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>R-sq</td>
<td>0.4502</td>
<td>0.4490</td>
</tr>
<tr>
<td>Adj R-sq</td>
<td>0.2407</td>
<td>0.2391</td>
</tr>
</tbody>
</table>
not significant as these are the ones thought to be related to the cost benefit analysis of the individual. Thus, I believe that one viable interpretation is that the not severe consequences are directly related to biological predispositions. On the other hand, severe consequences seems to depend heavily on cost/benefit analysis; Ida and Goto (2009) describe a mechanism in which risk aversion is related to drinking behavior because those who are risk averse are more likely to abstain from drinking to avoid its negative consequences. This is consistent with my findings in that as risk aversion increases by 1 (the number of safe choices), the number of negative severe consequences decreases by 0.443 on average. Becker and Murphy (1988) modeled learning as a decrease in the costs of consumption. Consistent with this assumption, I find that as learning (parental drinking in participant presence) increased, less severe consequences of drinking experienced. Thus, in terms of model, my finding supports the way in which learning was originally modeled (Becker & Murphy, 1988).

Instrumental Approach

Table 8: instrumental variable approach to investigating the effect of consequences on drinking

Note: the first set of results represent the instrumental approach while the second set represents OLS run on the same variables

<table>
<thead>
<tr>
<th></th>
<th>Drinks total (IV)</th>
<th>Drinks Total (OLS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal1</td>
<td>0.812 (2.651)</td>
<td>0.442 (2.608)</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.239 (0.348)</td>
<td>-0.209 (0.348)</td>
</tr>
<tr>
<td>Gender</td>
<td>4.338* (2.555)</td>
<td>4.986** (2.429)</td>
</tr>
<tr>
<td>Risk Aversion</td>
<td>0.439 (0.903)</td>
<td>0.847 (0.718)</td>
</tr>
<tr>
<td>Econ1</td>
<td>-0.244</td>
<td>0.650</td>
</tr>
<tr>
<td>Sports1</td>
<td>-5.459*</td>
<td>-6.134**</td>
</tr>
</tbody>
</table>
To determine the effects of consequences on total drinking, I ran an OLS regression with total drinking as the dependent variable. However, there is an issue with this in that there is a reciprocal nature between drinking and consequences that depends on my other variables of interest. Therefore, I used an instrumental variable approach with the parental drinking variables as instruments for the effect of consequences on total drinking. I chose these variables as the instruments because they were significantly related to consequences but not total drinking. The results are presented in table 8, and lead me to believe that drinking is a stronger driver of consequences rather than vice-versa. I find that as the number of consequences experienced decreases, total drinking decreases as well. This finding makes sense in the context of the effect of drinking on consequences but makes little intuitive sense in the other direction. Specifically, as the number of consequences increases, so does total drinking on average. Thus, it appears that drinking has a strong effect on consequences rather than consequences having a strong effect on total drinking as can be expected with

<table>
<thead>
<tr>
<th></th>
<th>Sports1</th>
<th>GroupID</th>
<th>Frat1</th>
<th>GroupEvents Ratio</th>
<th>Consequence Total</th>
<th>Parental Drinking</th>
<th>Parental drinking in participant’s presence</th>
<th>Drunking in parental presence</th>
<th>N</th>
<th>r-sq</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-5.459*</td>
<td>-0.381*</td>
<td>-1.347</td>
<td>1.238</td>
<td>1.164*</td>
<td></td>
<td></td>
<td></td>
<td>59</td>
<td>0.5404</td>
</tr>
<tr>
<td></td>
<td>(2.946)</td>
<td>(0.218)</td>
<td>(3.566)</td>
<td>(1.246)</td>
<td>(0.582)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-6.134**</td>
<td>-0.388*</td>
<td>-1.862</td>
<td>1.589</td>
<td>0.695</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5730</td>
</tr>
<tr>
<td></td>
<td>(2.587)</td>
<td>(0.219)</td>
<td>(3.337)</td>
<td>(1.107)</td>
<td>(0.264)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
addictive goods. Specifically, addictive goods are those whose consumption may depend heavily on benefits rather than costs.

Discussion

This study attempts to incorporate empirical findings and theoretical models of drinking to determine an experimental measure of predictors of drinking behavior. The major contribution of my study is identifying two exogenous traits that can be measured to determine an individual’s predisposition for risky drinking behavior. Specifically, it is possible that an assessment of risk aversion and exogenous learning could be used as a method of primary prevention among incoming college freshman.

However, the sample I use to examine drinking behavior may have been unrepresentative of the greater population. Specifically, participants exhibit perfect patience, less altruism, and less risk aversion than previous studies. Similarly, participants fail to respond to stakes and the group members surveyed represent less than half of the total organizations in their respective category. However, this being mentioned, these issues are controlled for as much as possible and many of my results are significant and consistent with theoretical predictions.

In the context of previous theoretical work, my finding that risk aversion negatively relates to total drinking and total consequences is consistent with predictions made by Ida and Goto (2009). Ida and Goto (2009) describe that in terms of utility maximization, higher risk aversion should result in lower drinking to avoid unnecessary costs. My finding supports this hypothesis in that I find as the number of safe lottery choices increase, total drinking and consequences experienced from drinking decreases. In stronger support of this hypothesis, I find a significant interaction between risk
aversion and being a legal drinker. This supports Ida and Goto’s (2009) conclusions in that responsibilities are higher for legal drinkers so that the costs of drinking would increase so that it makes intuitive sense that risk averse legal drinkers would experience less consequences than their non-legal counterparts on average.

My significant findings with regards to group identity may also have a valid interpretation in the theoretical context. Tomer (2001) describes a model in which drinking can be used as a method to increase different forms of capital that influence utility. He describes a model in which drinking benefits may be highly related to public opinion and social group. In the context of my findings, it makes sense that groups associated with more drinking (sports and fraternities) are positively correlated with drinking behavior. The idea being that the benefits of drinking increase for individuals interested in joining these groups because drinking can increase social and personal capital. My finding with regards to group events ratio and strength of group identity further this hypothesis, in that they provide evidence that group makeup and identity can have a significant impact on drinking behavior. The strongest support I have for this hypothesis is the significance and direction of the interaction between fraternity membership and group identity. Specifically, as one became more strongly identified with a group who values drinking, they were more likely to drink.

In terms of my findings regarding exogenous learning, Becker and Murphy (1988) provide a theoretical explanation for why this is the case. Specifically, they assumed that learning decreases the costs of drinking so that as one learns more they are also more likely to consume alcohol. My findings support this hypothesis in that learning is found to be positively correlated with total drinking. The strongest finding I have in support of
this argument is that exogenous learning increase total drinking but in some cases reduced total consequences (especially severe consequences). Thus, even though learning increases average drinking (potentially by lowering the cost of consumption), Becker and Murphy’s (1988) hypothesis that learning would reduce the costs of drinking is confirmed by the finding that in case of severe consequences learning is associated with fewer consequences.

Thus, this study investigates a number of theoretical predictions in the context of an experimental setting. I find support for some hypotheses and fail to find significance for others. However, the major contribution of this study is identifying two measures that could potentially identify at-risk individuals. Thus, one effective policy for reducing risky drinking could be to identify at-risk individuals before risky drinking can occur. Yet, for this to be the case further validation of the measures proposed in this paper would be necessary. This study creates a foundation for primary prevention that further research should seek to illuminate.

References


Appendix: Appendix
General Questionnaire
- What is your current age?
- What sex are you?
- What is your current class year?
- What is your current weight (in lbs)?
- What is your current height (in inches)?
- Which of the following groups do you best identify with?
  1. fraternity or sorority
  2. sports team
  3. musical group
  4. volunteer group
  5. theater group
  6. other
• For the group you chose in the previous question, please identify the specific group you were referring to. (i.e basketball team, the colgate 13, etc.)

• How strongly do you identify with other members of your social group?
  • 1 2 3 4 5 6 7
  • Not at All Very Strongly

• How important is your group to your identity?
  • 1 2 3 4 5 6 7
  • Not at All Very Important

• How often do you think of yourself as a member of your social group?
  • 1 2 3 4 5 6 7
  • Not at All Very Often

• How close do you feel to other members of your social group?
  • 1 2 3 4 5 6 7
  • Not at All Very Close

• How would you classify your participation in your groups events?
  • I regularly attend my groups events where alcohol is available
  • 1 2 3 4 5 6 7
  • Not at All Very Often

  • I regularly attend my groups events where alcohol is not available
  • 1 2 3 4 5 6 7
  • Not at All Very Often

• where do you currently live while attending school?
  a. Residence Hall, if so how many people do you live with?
  b. Fraternity/sorority house
  c. off-campus with family
  d. off-campus with friend
  e. off-campus alone
  f. apartment If, so how many people
  g. townhouse, if so how many people

Alcohol Questionnaires
During the PAST 30 DAYS, how often did you drink alcohol? (at least one drink)
a. every day  
b. nearly every day  
c. 5-6 times a week  
d. 3-4 times a week  
e. twice a week  
f. once a week  
g. once during the past 30 days  
h. didn’t drink in the past thirty days

During the PAST 30 DAYS, how much did you drink on the average drinking day?

a. 25 or more drinks  
b. 19 to 24 drinks  
c. 16 to 18 drinks  
d. 12 to 15 drinks  
e. 9 to 11 drinks  
f. 7 to 8 drinks  
g. 5 to 6 drinks  
h. 3 to 4 drinks  
i. 2 drinks  
j. 1 drink  
k. didn’t drink in the past thirty days  
  • During the PAST 30 DAYS, how often did you have 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol within a two-hour period?

a. every day  
b. nearly every day  
c. 5 to 6 times a week  
d. 3 to 4 times a week  
e. once or twice a week  
f. 2 to 3 times in the past thirty days  
g. once during the past thirty days  
h. didn’t drink 5(4) or more drinks at a single sitting in the past 30 days  
  • During the LAST 12 MONTHS, how often did you usually have any kind of drink containing alcohol?

a. every day  
b. 5 to 6 times a week  
c. 3 to 4 times a week
d. twice a week
e. once a week
f. 2 to 3 times a month
g. once a month
h. 3 to 11 times in the past year
i. 1 to 2 times in the past year
j. I did not drink in the past year, but I did drink in the past
k. I never drank alcohol in my life

• During the last 12 months, how many alcoholic drinks did you have on a typical day when you drank alcohol?

a. same options as above

• During the LAST 12 MONTHS, how often did you have 5 or more (males) or four or more (females) drinks containing any kind of alcohol within a two-hour period?

a. every day
b. 5-6 days a week
c. 3-4 days a week
d. 2 days a week
e. 1 day a week
f. 2-3 days a month
g. one day a month
h. 3 to 11 days in the past year
i. 1-2 days in the past year
j. didn’t drink 5 (4) or more drinks at a single sitting in the past twelve months

• During your lifetime, what is the largest number of drinks containing alcohol that you drank within a 24 hour period?

a. 36 or more drinks
b. 24-35 drinks
c. 18-23 drinks
d. 12-17 drinks
e. 8 to 11 drinks
f. 5 to 7 drinks
g. 4 drinks
h. 3 drinks
i. 2 drinks
j. 1 drink
k. I never drank alcohol in my life

Alcohol Questionnaires
(for the following questions, pick one of your guardians and answer all of the
questions for the same guardian, whichever you believe drinks more)

• During the LAST 12 MONTHS, how often did your guardian usually have any kind of drink containing alcohol?

  a. every day
  b. 5 to 6 times a week
  c. 3 to 4 times a week
  d. twice a week
  e. once a week
  f. 2 to 3 times a month
  g. once a month
  h. 3 to 11 times in the past year
  i. 1 to 2 times in the past year
  j. I did not drink in the past year, but I did drink in the past
  k. I never drank alcohol in my life

• During the last 12 months, how many alcoholic drinks did your guardian have on a typical day when you drank alcohol?

  a. same options as above

• During the LAST 12 MONTHS, how often did your guardian have 5 or more (males) or four or more (females) drinks containing any kind of alcohol within a two-hour period?

  a. every day
  b. 5-6 days a week
  c. 3-4 days a week
  d. 2 days a week
  e. 1 day a week
  f. 2-3 days a month
  g. one day a month
  h. 3 to 11 days in the past year
  i. 1-2 days in the past year
  j. didn’t drink 5 (4) or more drinks at a single sitting in the past twelve months
During their lifetime, what is the largest number of drinks containing alcohol that your guardian drank within a 24 hour period?

a. 36 or more drinks
b. 24-35 drinks
c. 18-23 drinks
d. 12-17 drinks
e. 8 to 11 drinks
f. 5 to 7 drinks
g. 4 drinks
h. 3 drinks
i. 2 drinks
j. 1 drink
k. I never drank alcohol in my life

In the past 12 MONTHS how often has your guardian consumed an alcoholic beverage in your presence?

a. every day
b. 5-6 days a week
c. 3-4 days a week
d. 2 days a week
e. 1 day a week
f. 2-3 days a month
g. one day a month
h. 3 to 11 days in the past year
i. 1-2 days in the past year
j. never consumed an alcoholic beverage in your presence

In the past 12 MONTHS how often have you consumed an alcoholic beverage in your guardian’s presence?

a. every day
b. 5-6 days a week
c. 3-4 days a week
d. 2 days a week
e. 1 day a week
f. 2-3 days a month

g. one day a month

h. 3 to 11 days in the past year

i. 1-2 days in the past year

j. never consumed an alcoholic beverage in your guardian’s presence

Consequence Questionnaire

(Note: the first twelve items are the not severe consequences)

a. While drinking, I have said or done embarrassing things.
b. I have had a hangover (headache, sick stomach, etc.) the morning after I had been drinking.
c. I have felt very sick to my stomach or thrown up after drinking.
d. I often have ended up drinking on nights when I had planned not to drink.
e. I have taken foolish risks when I have been drinking

f. I have passed out from drinking.
g. I have found that I need larger amounts of alcohol to feel any effect, or that I could no longer get high or drunk on the amount that used to get me high or drunk.
h. When drinking, I have done impulsive things I regretted later
i. I’ve not been able to remember large stretches of time while drinking heavily.
j. I have driven a car when I knew I had too much to drink to drive safely.
k. I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.
l. My drinking has gotten me into sexual situations I later regretted.
m. I have often found it’s difficult to limit how much I drink.
n. I have become very rude, obnoxious, or insulting after drinking

o. I have woken up in an unexpected place after heavy drinking.
p. I have felt badly about myself because of my drinking

q. I have had less energy or felt tired because of my drinking.
r. The quality of my work or schoolwork has suffered because of my drinking.
s. I have spent too much time drinking.
t. I have neglected my obligations to family, work, or school because of drinking.
u. My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.
v. I have been overweight because of drinking.
w. My physical appearance has been harmed by my drinking.
x. I have felt like I needed a drink after I’d gotten up (that is, before breakfast)