Examining the Relationship Between Alcohol Expectancies and Behavioral Economic Theory

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EXAMINING THE RELATIONSHIP BETWEEN ALCOHOL EXPECTANCIES AND BEHAVIORAL ECONOMIC THEORY

by

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Clinical Psychology in the Department of Psychology in the College of Sciences at the University of Central Florida Orlando, Florida

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ABSTRACT

PURPOSE: Alcohol consumption and related problems are common among college students. Prior research links behavioral economic constructs of alcohol demand (relative valuation of alcohol; analyzed using area under the curve) and relative reinforcement (RR; proportionate reinforcement obtained from alcohol-related activities relative to other activities), as well as alcohol expectancies, with alcohol consumption and problems. However, research has yet to examine the associations between behavioral economic and expectancy theories or how they influence alcohol use outcomes. METHOD: College students who endorsed drinking in the past 30 days (n= 287) completed an online survey assessing demand, RR, alcohol expectancies, alcohol problems, and alcohol use. A test of indirect effects examined the impact of alcohol expectancies and alcohol use on the association between demand and alcohol problems, as well as the association between RR and alcohol problems. RESULTS AND CONCLUSIONS: The final model showed adequate fit. There were significant positive associations between demand, RR, and alcohol problems. Higher demand and RR were associated with stronger alcohol expectancies, which partially mediated the association between demand and RR and alcohol problems. Findings suggest that demand and RR may be directly related to alcohol expectancies; a relationship that has not been previously identified. Moreover, alcohol expectancies may serve as the functional mechanism linking demand and RR to alcohol problems. Thus, alcohol expectancies may be an important intervention target for reducing alcohol problems. Future intervention research is needed to evaluate if changes in expectancies attenuate the association between demand and RR to alcohol problems.
For my mother, the epitome of strength, for always believing in me and providing unconditional love and endless support

For my partner Jace who is my rock; constantly in my corner and always there to pick me up every time I fall.
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INTRODUCTION

Alcohol Use Among College Students

Alcohol use among college students remains a harmful and chronic problem that may lead to a host of negative consequences that include but are not limited to, academic decline, sexual assault, injury, health problems, and even death (Schulenberg et al., 2020; National Institute of Alcohol Abuse and Alcoholism, 2020; White, & Hingson 2013). Alcohol consumption among college students is accountable for approximately 696,000 assaults, 97,000 sexual assaults, and 1,519 deaths annually (Slutske, 2005). Additionally, it is estimated that about 54.9% of students have consumed alcohol within the past month. Of those students, approximately 36.9% engage in dangerous drinking behavior such as binge drinking (i.e., 4+/5+ drinks in a two-hour period for females/males), and about 9.6% engage in heavy alcohol use (i.e., 7+/14+ drinks per week for females/males) (National Institute of Alcohol Abuse and Alcoholism, 2020). The culture on college campuses perpetuates an environment where consuming alcohol is accepted and encouraged (Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002). For example, when comparing alcohol consumption rates among college-aged youth, students who attend university were found to consume more alcohol than their same-age non-university attending peers (Carter et al., 2010). Due to the slew of potentially harmful and life-threatening consequences that can arise as a result of college student drinking, research aimed at understanding alcohol consumption within this population and its negative consequences remains pertinent.
Theoretical Model/Background

Behavioral economic theory uses principles of economics and psychology as a means to study and predict human behavior (Murphy et al., 2007). Alcohol demand and relative reinforcement (RR) are two constructs based in behavioral economic theory used to understand alcohol use and alcohol-related problems. Alcohol demand is assessed using the Alcohol Purchase Task (APT) which asks participants to purchase hypothetical drinks at increasing price points to determine an individual’s valuation for alcohol. The assessment of alcohol demand provides information on how much an individual is willing to expend valuable resources, such as monetary funds, on alcoholic beverages. Therefore, alcohol demand can be used to identify how much an individual values a substance from a fiscal perspective (Kaplan et al., 2018). While alcohol demand provides an economic valuation of alcohol consumption, RR provides information on the level of reinforcement or reward an individual associates with alcohol. RR is determined by assessing how rewarding substance-related activities (i.e., activities that include alcohol consumption) are in comparison to substance-free activities (Kaplan et al., 2018). These aspects of behavioral economic theory are necessary to understanding the agencies that drive alcohol consumption. In addition to behavioral economic indicators of consumption, research exists that directly links cognitive aspects of reward based on previous experiences related to drinking (Goldman, 1994). These experiences lead to expectations about what may occur during a drinking episode, better known as alcohol expectancies.

Alcohol expectancies are an individual’s expectations regarding events, thoughts, or feelings that may occur as a result of alcohol consumption (Jones et al., 2001). Based in social learning theory, alcohol expectancies are learned information about the anticipated effects of
alcohol that are formed and changed across the lifespan as a result of life experiences and drinking experiences (Smit et al., 2018). Alcohol expectancies are believed to be acquired and maintained through two phases. The acquisition phase occurs prior to any consumption of alcohol. Expectancies in this phase are primarily based on observational learning and one’s surrounding environment and occur prior to any personal experience with alcohol (Brown et al., 1987). The maintenance phase occurs after alcohol consumption has occurred in the individual’s life and is primarily based on direct drinking experiences (Campbell et al., 2010). Both the acquisition and the maintenance phases impact the development of alcohol expectancies and subsequent drinking behaviors. This phenomenon provides support for past research in which alcohol expectancies were found to be malleable and subject to change in experimental settings in addition to the idea that the formation of expectancies occurs via social learning theory (Darkes & Goldman, 1993; Darkes & Goldman, 1998).

Continued alcohol use among college students is evidently concerning. Two theoretical approaches; behavioral economic and alcohol expectancy theory, have been utilized in past research to better understand continued problematic alcohol use within this population. While both behavioral economics and alcohol expectancy theory have successfully identified a relationship between their respective theories and alcohol use and problems, they have yet to be combined to better understand the mechanisms contributing to continued consumption and subsequent problems in college student populations.
Alcohol Demand

Alcohol demand is a behavioral economic construct that aims to identify the extent to which an individual values a substance, in this case alcohol. Valuation of alcohol is determined through a person’s willingness to allocate valuable resources towards obtaining and/or using alcohol such as time and money. Levels of alcohol demand vary depending on the individual and are therefore a person specific means of identifying valuation of a substance. This valuation is assessed using the Alcohol Purchase Task (APT) which measures the number of drinks a person would consume at rising hypothetical price points (Murphy & MacKillop, 2006). The information obtained from the APT can then be used to plot what is referred to as a demand curve. A demand curve is utilized to provide a visual representation of a participant’s APT responses for each price point.

Past research suggests that when the price of alcohol is low, individuals are more likely to consume greater amounts of alcohol, however, as price increases, alcohol consumption is generally expected to decline (Olsen et al., 2020, Martinetti et al., 2019). Therefore, individuals who continue to consume at higher prices are said to have greater levels of alcohol demand. Individuals who display increased alcohol demand may be more likely to consume greater quantities of alcohol and experience more alcohol-related problems. Results of a study conducted by Bertholet et al., (2015) indicated that monetary cost significantly influenced alcohol consumption and drinking outcomes in their sample. Specifically, participants with high alcohol demand were increasingly more likely to experience alcohol-related problems and engage in problematic alcohol use. This suggests that those with increased alcohol demand may value alcohol more compared to those with lower levels of demand in that those with higher levels of
demand are less sensitive to increases in price. Therefore, alcohol demand may be imperative to
detecting individuals at greater risk of engagement in potentially harmful alcohol consumption.

Further research using the APT has found similar results (Chaloupka et al., 2002; Chaloupka, 1993; Strickland et al., 2019). The APT paradigm provides individuals with hypothesetical incremental price points, which allows the researcher to identify the number of drinks an individual would consume at any given price. In addition, the APT allows for measurement of five demand indices: intensity, \( P_{\text{max}} \), \( O_{\text{max}} \), breakpoint and elasticity. Intensity indicates how much alcohol would be consumed if the price was zero, \( P_{\text{max}} \) indicates the price when the most drinks were consumed, \( O_{\text{max}} \) indicates the highest number of drinks consumed, breakpoint indicates the price when no further drinks were consumed, and elasticity indicates the extent in which an individual is sensitive to the change in price of the substance (Murphy & MacKillop, 2009). To consolidate these five demand indices into a single variable, researchers use area under the curve (AUC) where higher AUC values indicate greater levels of alcohol demand (Amlung et al., 2015).

Alcohol demand provides information pertaining to the inherent value an individual places upon a substance. Therefore, alcohol demand may be central to explaining continued alcohol consumption among college students, despite the possibility of subsequent adverse consequences. Specifically, among college student populations, demand may be particularly useful in detecting greater risk of experiencing alcohol-related problems such as risky sexual behavior, drunk driving, and hospitalizations (Amlung et al., 2012; Teeters et al., 2014; Lemley et al., 2017; Acuff et al., 2018). Therefore, alcohol demand is central to understanding continued
use of alcohol in college student populations by providing information on the level of value the individual places upon alcohol.

Relative Reinforcement

Relative reinforcement (RR) (also referred to as alcohol reward value) is a behavioral economic construct used to measure the amount that an individual finds alcohol to be reinforcing or rewarding when compared to potential alternative alcohol-free reinforcers (Murphy et al., 2005, 2006, 2007a). The RR of alcohol may be measured using the Adolescent Reinforcement Survey Schedule-Substance Use Version (ARSS-SUV) (Murphy et al., 2005) which asks participants to identify how often they engage in certain activities and their subsequent enjoyment ratings for each activity with and without alcohol. A value derived from Hernstein’s matching law is then calculated from the answers provided referred to as the relative reinforcement ratio (Hernstein, 1970). The matching law states that individuals choose to partake in certain behaviors in a ratio that is equivalent to the ratio of reinforcement that exists for said behaviors. Once calculated, this ratio provides the researcher with a quantification of how rewarding a participant finds substance-related activities compared to all activities (both substance-free and substance-related). Problematic alcohol use is more likely to occur when an individual has a high relative reinforcement ratio (Rachlin, 1997). A high relative reinforcement ratio indicates greater reinforcement of substance-related activities, suggesting that an individual finds substance-free activities less rewarding and therefore, may be at increased risk for consumption and problems related to alcohol (Murphy et al., 2005; Skidmore & Murphy, 2010). RR has been evaluated in college student populations resulting in similar findings. Greater levels
of RR in college student populations have been associated with increased alcohol consumption and problems (Hallgren et al., 2016). Therefore, RR may be useful in predicting future problematic alcohol use and improving current prevention and intervention tactics related to alcohol use within college student populations (Strickland et al., 2019).

**Alcohol Expectancies**

Alcohol expectancies are the expectations or beliefs individuals possess about the effects that alcohol will have on them. Further, they are person specific and tend to vary based on the context of the drinking event (Connors et al., 1992). These expectations and beliefs subsequently influence drinking decisions and behavior (Fromme & D’Amico, 2000). Alcohol expectancy theory is based in social learning theory. Therefore, alcohol expectancy theory posits that expectancies are derived and maintained through learning and memory. This is further illustrated through the theoretical conceptualization of alcohol expectancies as a cognitive component of an individual’s memory network (Goldman, 2002; Goldman et al., 1999, Dunn & Goldman, 2000). This memory network contains information acquired across the lifespan related to expectations about alcohol use derived from observation and direct experience of alcohol consumption. Expectations about alcohol use are thus developed, reinforced, and even changed through learned information and become activated through memory when alcohol cues are salient (i.e., consuming alcohol, thinking about consuming alcohol, observing an individual drink, etc.).

Previous research provides support for the separation of alcohol expectancies into two distinct groups: positive expectancies and negative expectancies (Stacy et al., 1990b). Positive expectancies are expectations pertaining to alcohol use that are inherently positive or pleasant
such as, tension reduction, increased sociability or “liquid courage”, and positive sexual experiences (Fromme et al., 1993). Negative expectancies are expectations pertaining to alcohol use that are inherently negative or adverse such as, cognitive and behavioral impairment, increased physical risk, increased risk and aggression, and negative self-perception (Fromme et al., 1993). A study conducted by Brown, Goldman, and Christiansen, (1985) analyzed expectancies in college students, people with alcohol use disorders, and patients who reported excessive drinking. Results indicated that majority of individuals from these populations reported positive alcohol expectancies, which in turn, encouraged them to repeat drinking behavior. Furthermore, in college student populations positive alcohol expectancies have been linked to potentially harmful drinking behavior, such as binge drinking, whereas negative alcohol expectancies have been found to have less of an effect on drinking outcomes (Goldman, 1994; McBride et al., 2014; Magri et al., 2020). Nevertheless, some research has determined that negative alcohol expectancies may be associated with a decrease in alcohol consumption (Jones et al., 2001).

Research examining college student populations has revealed a relationship between alcohol expectancies, alcohol consumption, and alcohol-related problems in that individuals with more positive alcohol expectancies tend to consume more alcohol and are at greater risk of experiencing alcohol-related problems (McBride et al., 2014; Li et al., 2012; Nicolai et al., 2010). The relationship between positive alcohol expectancies, such as sociability, and increase in alcohol use and problems may be explained through an individual’s desire or motivation to consume in hopes to experience related positive effects (Kuntsche et al., 2007). Therefore, alcohol expectancies may explain continued alcohol use despite the experience of negative
consequences through mobilization of alcohol consumption via one’s motivation to drink (Cooper et al., 2016). This is illustrated through the relationship between alcohol expectancies and drinking motives. For instance, certain categories of drinking motives such as enhancement, social, and coping motives have been found to mediate the relationship between alcohol expectancies and alcohol-related consequences (Diep et al., 2016).

**Relationship between Alcohol Use, Demand, Reinforcement, and Expectancies**

The extant literature has investigated alcohol consumption and alcohol-related consequences through the lens of either behavioral economic or alcohol expectancy theory. As a result, there is limited research evaluating risk factors for problematic alcohol consumption or alcohol-related consequences from a perspective combining both theories. This combined approach may provide a unique perspective for a more comprehensive understanding of risk factors associated with college student drinking. While behavioral economic theory has been used to understand the level of valuation an individual places on alcohol, it is insufficient in explaining why an individual places value upon alcohol. Therefore, alcohol expectancy theory may be useful to compensate for the gap left when examining college student drinking using behavioral economics alone. Dennhardt et al. (2016) conducted a study analyzing the relationship between drinking motives and the RR of alcohol in military veterans. Results of this study indicated that individuals who had increased reward (i.e., greater levels of relative reinforcement value) from alcohol reported increased motivation to drink and as a result, experienced greater alcohol-related consequences. Motivation to drink is defined as an individual’s drive to drink to experience a desired effect, which while inherently different from
alcohol expectancies, has been found to mediate the relationship between alcohol expectancies and alcohol use (Goldsmith et al., 2009; Kuntsche et al., 2007). While Dennhardt et al. (2016) analyzed drinking motives as opposed to alcohol expectancies, these findings suggest a relationship between drinking motives and RR that may also occur when examining alcohol expectancies, RR, and alcohol demand.

### Summary/Current Study

The hypotheses in the current study were conceptualized through existing behavioral economic and alcohol expectancy theory. Behavioral economics is currently used to explain an individual’s valuation and reward for alcohol through alcohol demand and RR. However, behavioral economics fails to address the role in which past experiences and expectations play in continued and potentially problematic alcohol use. Therefore, alcohol expectancy theory has the potential to fill in the gap left unexplained by behavioral economic theory alone.

The goal of the present study is to examine differences in associations between alcohol use/consequences, alcohol demand, relative reinforcement, and positive alcohol expectancies. The hypotheses for the current study are as follows.

1a. It is hypothesized that alcohol demand will be positively associated with alcohol expectancies.

1b. It is hypothesized relative reinforcement will be positively associated with alcohol expectancies.

2a. It is hypothesized that alcohol expectancies will have an indirect effect on the relationship between alcohol demand and alcohol use.
2b. It is hypothesized that alcohol expectancies will have an indirect effect on the relationship between relative reinforcement value and alcohol use.

3a. It is hypothesized that alcohol expectancies and alcohol use will have an indirect effect on the relationship between alcohol demand and alcohol-related problems.

3b. It is hypothesized that alcohol expectancies and alcohol use will have an indirect effect on the relationship between relative reinforcement and alcohol-related problems.
METHOD

Participants

Participants were individuals who attended the University of Central Florida (UCF) at the time of data collection comprising a total sample of 429 individuals. Participants included only those who were 18 years of age or older, spoke fluent English, and endorsed alcohol consumption in the past 30 days. The university’s Institutional Review Board approved all procedures of the study. See Table 1 for descriptive information on the current sample.

Procedure

Participants completed an online survey which included measures of alcohol consumption and consequences, alcohol expectancies, alcohol demand, relative reinforcement, and demographic information. Participants were compensated for their participation with SONA credit upon survey completion.

Measures

Demographics

Demographic information was collected using a series of questions. Participants provided information on their race, ethnicity, age, income, and gender.

Alcohol Use

Alcohol consumption was assessed using the Daily Drinking Questionnaire (DDQ, Collins et al., 1985). The DDQ provides information about alcohol consumption on a weekly basis. This measure inquiries about the estimated number of drinks consumed each day of the week over a month-long period. The values are then summed to acquire a weekly number of
drinks consumed (National Institute of Alcohol Abuse and Alcoholism, 2020). The current study revealed good internal consistency ($\alpha = .89$).

**Alcohol-Related Problems**

Alcohol-related problems were assessed using the Brief Young Adult Alcohol Consequences Questionnaire (B-YAACQ, Kahler et al., 2005). The B-YACCQ is a self-report survey comprised of 24-items used to assess alcohol-related consequences within a six-month period. This measure utilizes dichotomous yes/no answer choices to determine whether the respondent has experienced the relevant consequences. This questionnaire has been determined to be both valid and reliable ($r = .86$; Kahler et al., 2008). The current study revealed adequate internal consistency ($\alpha = .77$).

**Alcohol Demand**

Alcohol demand was assessed using the Alcohol Purchase Task (Murphy & MacKillop, 2006). The Alcohol Purchase Task (APT) is a measure that utilizes hypothetical scenarios to measure self-reported alcohol consumption and financial value across incremental price points. Participants report the number of standard drinks they would consume ranging from a price of $0 (free) to $15 per drink. Five demand indices are derived from the APT: breakpoint, intensity of demand, $O_{\text{max}}$, $P_{\text{max}}$, and elasticity of demand. Alternatively, a single composite score can also be calculated instead of the five demand indices known as Area Under the Curve (AUC; Amlung et al., 2015). Utilizing AUC reduces the number of statistical tests required to analyze the data and therefore, enables control of the type 1 error rate. The APT has demonstrated good construct validity (Kiselica et al., 2016) and good test-retest reliability (Murphy et al., 2009).
Relative Reinforcement

Relative Reinforcement was assessed using the Adolescent Reinforcement Survey Schedule-Substance Use Version (ARSS-SUV; Cautela & LaCross, 1981a, pp. 3-8). This measure assesses reinforcement of a range of activities with alcohol and without. Participants rate the frequency they engage in activities both with and without alcohol ranging from 0 (0 times) to 4 (more than once a day). Additionally, respondents indicate how much they enjoy partaking in an activity both with and without alcohol on a scale ranging from 0 (unpleasant or neutral) to 4 (extremely pleasant). Participant’s responses are then calculated and converted into a numerical value known as the relative reinforcement ratio by first multiplying the frequency and enjoyment scores for both substance-free and substance-related activities to obtain a cross product value. The cross-product values are then summed and both the substance-free total and a substance-related total reinforcement values are acquired. Lastly, the reinforcement ratio is calculated by dividing the substance-related total by the substance-related total plus the substance-free total. Both substance-free reinforcement ($\alpha = .95$) and substance-related reinforcement ($\alpha = .97$) demonstrated excellent internal consistency.

Alcohol Expectancies

Alcohol expectancies were assessed using the Comprehensive Effects of Alcohol: Expected Effects measure (CEOA; Fromme et al., 1993). The measure provides respondents with 38 statements of possible effects of alcohol consumption. Respondents provide answers on a scale from 1 (disagree) to 4 (agree) depending on the degree in which they expect to experience that effect when they consume alcohol. The expectancies are broken into positive and negative outcomes which are further subdivided. The positive expectancy category is comprised of the following categories: sociability, tension reduction, liquid courage, and sexuality. The negative
expectancy category is comprised of the following categories: cognitive and behavioral impairment, risk and aggression, and self-perception. The CEOA was found to have satisfactory validity (Fromme et al., 1993). The current study revealed excellent internal consistency ($\alpha=.91$).

**Power Analysis**

To determine sample size, a montecarlo simulation was conducted using 1,000 replications in Mplus 8.11. Previous literature has yet to analyze the association between alcohol expectancies and behavioral economics. However, previous research has identified a link between alcohol demand, relative reinforcement value, drinking motives, and alcohol use and problems respectively. Based on this research, I assumed a small association between positive alcohol expectancies and alcohol demand (H1a path: $r=0.2$), a small association between positive alcohol expectancies and relative reinforcement value (H1b path: $r=0.25$), a small association between positive alcohol expectancies and alcohol use (path 2: $r=0.25$), a small association between positive alcohol expectancies and alcohol problems (path 3: $r=0.15$), and a large association between alcohol use and problems (path e: $r=0.4$). This analysis indicated that a sample of $N=325$ would be required to detect significant indirect effects for hypotheses 2 and 3 assuming 1-B>.80 and alpha <.05.

H1a power=.91, H1b power=.98, H2a: power=.96, H2b power=.87, H3a power=.94, H3b power=.85.
Data Analysis Plan

Data Preparation

A total of \( N = 429 \) participants responded to the survey. Respondents with missing data across all measures were first removed from the dataset \((n = 12)\). Additionally, the following participants were removed from analyses based on their responses on the APT: missing data across the APT \((n = 13)\), no endorsement of hypothetical drink purchases across all price points (i.e., no demand, \( n = 102 \)), 2 or more reversals in APT responses \((n = 2)\), constant demand \((n = 1)\), and due to the inability to generate elasticity using fewer than 2 datapoints \((n = 12)\). Removal of participants who met the above criteria resulted in a final sample of \( n = 287 \) participants. APT outliers were identified \((Z\) scores > 3.29) and windorized (recoded to one unit higher than the highest non-outlier value) in accordance with Tabachnick & Fidel (2018). A small number of outliers were identified \((97\) data points; 1.20% of the data), windorized and retained for analyses.

All test variables were examined for violations of normality, linearity, and homoscedasticity. With the exception of the latent expectancy variable, all test variables demonstrated normality of residuals without correction. The latent expectancies variable demonstrated mild skewness; however, it was deemed acceptable without transformations due to the robust MLR estimator used in the analyses.

Pearson correlations were conducted in IBM SPSS Statistics (Version 27) on test and demographic variables to assess for the presence of covariates (See Table 2).

Alcohol Demand: Area Under the Curve

APT responses were used to generate expenditure and consumption curves for every participant. GraphPad Prism 9 was used to calculate AUC values for the consumption curves (Amlung et al., 2015). The total area was operationalized as the AUC value when the maximum
consumption value across the entire sample was input at each price. For this sample, the maximum number of drinks purchased across all prices was 16. Therefore, total AUC was calculated by generating a demand curve with the maximum number of drinks purchased across all prices (i.e., 16) multiplied by the total number of prices (i.e., 15) yielding a denominator of 240. Proportionate AUC values (ranging from 0.0 to 1.0) were then generated by dividing each participant’s raw AUC value by the total AUC. Higher AUC values reflect greater alcohol demand. We elected to use AUC to reduce the number of statistical tests in order to reduce Type I error.

Analysis Overview
To examine participant’s comprehensive alcohol expectancies, a latent variable was created utilizing both the positive and negative subscales of the CEOA. A measurement model was first run to complete a confirmatory factor analysis (CFA) to examine the latent alcohol expectancies variable. Findings indicated that the subscale “self-perception” did not properly load onto the expectancy factor and was therefore removed prior to analyses.

Using Mplus 8.11 a structural equation model containing observed, and a single latent variable (alcohol expectancies) was used to test the association between alcohol demand, RR, and alcohol-related problems (Muthén & Muthén, 2017). Bootstrapping was utilized in this model as a bias correction tool in test of indirect effects. This model was used to examine the indirect effects of alcohol use and alcohol expectancies on the relationship between alcohol demand, RR, and alcohol-related problems (See Table 3).

To test the fit of our hypothesized model, a structural model containing only the direct paths was first conducted. Next, modification indices were examined to identify the existence of correlated errors among the variables comprising the expectancies latent factor. After the
necessary correlated errors were iteratively freed and added to the model, the fit of the new model was reexamined. The original measurement model and the model containing the correlated errors was compared using the Satorra-Bentler Chi-square test for model fit. Lastly, to test our hypotheses, a structural equation model containing all proposed direct and indirect paths was conducted.
RESULTS

Prior to the test of direct and indirect effects, preliminary correlations were conducted. Results of this analysis revealed significant and positive correlations between alcohol demand and alcohol use ($r = .35, p < .001$), alcohol related problems ($r = .31, p < .001$) and alcohol expectancies ($r = .21, p < .001$). Significant positive correlations were also found amongst RR and alcohol use ($r = .54, p < .001$), alcohol-related problems ($r = .44, p < .001$), and alcohol expectancies ($r = .23, p < .001$).

Results of the initial structural equation model (SEM) indicated poor fit for the initial model ($\chi^2(29) = 112.84, p < .001$; RMSEA = .10, CFI = .91, SRMR = .06). Assessment of the modification indices revealed several correlated errors. All correlated errors containing a value greater than 15 were iteratively freed. Final examination of the modification indices resulted in three freed correlated errors related to the latent alcohol expectancies variable (risk and aggression with tension reduction; risk and aggression with cognitive and behavioral impairment; risk and aggression with sociability). Freedom of the appropriate correlated errors resulted in a model with adequate fit ($\chi^2(26) = 65.85$, RMSEA = .07, CFI = .96, SRMR = .06). The new model containing the correlated errors was next compared to the original measurement model using the Satorra-Bentler Chi-square test. Results of this test indicated that the addition of the three correlated errors significantly improved the model ($\Delta$Satorra-Bentler $\chi^2(3) = 46.46, p < .001$).

The SEM results suggest significant positive associations between RR and alcohol expectancies ($\beta = .16, SE = .06, p = .012$), RR and alcohol use ($\beta = .45, SE = .07, p < .001$), alcohol demand and alcohol expectancies ($\beta = .23, SE = .06, p < .001$), alcohol expectancies and alcohol-
related problems ($\beta = .09$, $SE = .04$, $p = .046$), alcohol expectancies and alcohol use ($\beta = .14$, $SE = .05$, $p = .005$), and alcohol use and alcohol-related problems ($\beta = .56$, $SE = .09$, $p < .001$).

Additionally, results indicated non-significant associations between RR and alcohol-related problems ($\beta = .12$, $SE = .09$, $p = .199$), alcohol demand and alcohol-related problems ($\beta = .06$, $SE = .07$, $p = .406$), and alcohol demand and alcohol use ($\beta = .16$, $SE = .09$, $p = .073$) when expectancies were accounted for in the model. See Figure 1.

The test of indirect effects indicated significant total (IND = .18, $SE = .08$, $p = .017$, 95% CI [.03, .33]) and total indirect effects (IND = .12, $SE = .05$, $p = .009$, 95% CI [.04, .22]) for alcohol demand, suggesting that alcohol expectancies and alcohol use indirectly influence the relationship between alcohol demand and alcohol problems. Similarly for RR, results indicated significant total (IND = .39, $SE = .09$, $p < .001$, 95% CI [.22, .56]) and total indirect effects (IND = .27, $SE = .06$, $p < .001$, 95% CI [.16, .40]), suggesting that alcohol expectancies and alcohol use indirectly influence the relationship between RR and alcohol-related problems.
DISCUSSION

The current study aimed to examine the relationship between alcohol demand, RR, alcohol expectancies, and alcohol-related problems in a sample of heavy drinking college students. Our results showed significant positive associations between alcohol demand and alcohol expectancies as well as RR and alcohol expectancies, suggesting that individuals who report higher levels of demand and RR may also maintain more firmly held alcohol expectancies, potentially putting them at risk for the experience of greater alcohol-related problems. This is the first study to utilize these two theoretical perspectives to examine college student alcohol use, and this novel finding opens new avenues for understanding the underlying mechanisms which contribute to problematic alcohol use within this population. Given that alcohol expectancies are rooted in learning and memory (Goldman, 2002) and are susceptible to change based on previous alcohol experiences, it is possible that the outcome of the expected alcohol effects may influence the value and reinforcement an individual places on alcohol.

The finding that alcohol expectancies partially mediate the relationship between both demand and alcohol-related problems and RR and alcohol-related problems is consistent with previous research in which alcohol expectancies have been identified as a mediating mechanism explaining the relation between alcohol-related outcomes and impulsivity, peer influence, and societal masculine norms (Han & Short, 2009; Lau-Barraco et al., 2012; Iwamoto et al., 2014). Furthermore, the concept of reinforcer pathology (Bickel et al., 2011) may provide additional support for this indirect effect finding. Reinforcer pathology posits that reinforcement related to problematic substance use stems from overvaluation and preference for immediate gratification of substance use (Bickel et al., 2011) and this overvaluation leads to an increase in pathological...
use. Alcohol expectancies, therefore, may serve as the underlying factor to explain this increased valuation of alcohol in this population. Activation of alcohol expectancies within an individual’s memory network may be further reinforced through the fulfillment of an individual’s expectancies (Rather & Goldman, 1994). For example, if an individual has positive expectations with regard to alcohol use, this expectation may be strengthened and reinforced if those expectations are experienced during observed and/or direct drinking events. This in turn may increase the likelihood for this expectation to become activated during the next drinking event. The repeated activation of these alcohol expectancies over time may reinforce the notion that alcohol is valuable and rewarding and therefore should be continually obtained and used.

Overall, these novel findings provide valuable insight into the mechanisms and underlying factors that may contribute and perpetuate problematic alcohol use within this population.

While the preliminary correlations indicated strong positive associations between alcohol demand and alcohol use/problems along with RR and alcohol-related problems (See Table 2), when alcohol expectancies are accounted for in the model, the associations were no longer significant. Suggesting the non-significant associations in the SEM likely are a result of the inclusion of alcohol expectancies. Thus, alcohol expectancies may serve to better account for the relationship amongst demand, RR, alcohol use, and alcohol-related problems. Prior research on the relationship between demand and alcohol use/problems, and RR and problems report mixed results. While some studies found significant associations between demand, RR, alcohol use, and problems (Murphy & MacKillop, 2006; Murphy et al., 2015), others suggest demand and RR were not associated with alcohol use and adverse outcomes (MacKillop and Murphy, 2007; Yurasek et al., 2011), and still others report demand as a predictor of problems but not use
Future research is needed to parse out the factors contribute to these varying results, including the role of alcohol expectancies.

These results have some important clinical implications. Expectancy and behavioral economic based interventions such as expectancy challenges and substance-free activity sessions (SFAS) have been shown to be useful in producing meaningful change related to substance use (Darkes et al., 1998; Lau-Barraco & Dunn, 2008; Murphy et al., 2012; 2019; 2021). Therefore, the identification of alcohol expectancies as the potential link between demand, RR, and alcohol-related problems may be used to combine interventions based in expectancy and behavioral economic theory. Doing so may prove useful in promoting lasting reductions in alcohol use.

There is potential that these findings may also lay the foundation for the creation of new expectancy and behavioral economic focused prevention and intervention efforts aimed at the reduction of alcohol-related problems in this population.

These findings should be considered in the context of several limitations. First, the data collected for the current study is cross-sectional in nature therefore limiting our ability to examine changes across time, which may impact the detection of directionality or determination of a causal agent among these variables. Second the study’s sample was comprised entirely of university attending students. As a result, the generalizability of these findings may be limited to individuals attending similar large-scale universities. In addition, due to the demand data cleaning requirements we were we unable to retain a large amount of participants. This evidently reduced our sample size to below the estimated number of participants required to detect effects calculated in the power analysis. However, the statistical analyses used nonetheless maintained the ability to detect significant results in the current study.
Lastly, several of the measures used such as the ARSS-SUV, DDQ, and the B-YAACQ are self-report measures which require participants to recall information over a 30-day period. This reliance on memory may be subject to recall bias, leading to potentially inaccurate responses (Raphael, 1987). Despite these limitations, our participants had considerable racial and ethnic diversity. This diverse sample suggests the potential for good generalizability of our findings to similar large public universities in the United States.

Overall, this study contributes novel findings to the college drinking literature by utilizing a combined theoretical perspective of behavioral economic and alcohol expectancies. The identification of the mediating role of alcohol expectancies in the relationship between behavioral economic variables of alcohol demand and RR and alcohol-related problems reveals opportunities for new areas of research and potential intervention targets. Future research is warranted to evaluate if these findings can be replicated longitudinally and if indeed intervening on these mechanisms may alter alcohol use outcomes in this high-risk population of heavy drinking college students.
APPENDIX A: TABLES AND FIGURES
Figure 1 Path Model: Direct Effects. All direct paths between alcohol demand, RR, alcohol expectancies, alcohol use, and alcohol-related problems. Additionally, standardized coefficients and the significant level are provided for each path.
Table 1. Descriptive Statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>20.28</td>
<td>3.37</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>-</td>
<td>-</td>
<td>94 (32.8)</td>
</tr>
<tr>
<td>Female</td>
<td>-</td>
<td>-</td>
<td>191 (66.6)</td>
</tr>
<tr>
<td>Transgender</td>
<td>-</td>
<td>-</td>
<td>2 (.70)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>-</td>
<td>-</td>
<td>140 (48.8)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-</td>
<td>-</td>
<td>57 (19.9)</td>
</tr>
<tr>
<td>Asian</td>
<td>-</td>
<td>-</td>
<td>24 (8.4)</td>
</tr>
<tr>
<td>Black</td>
<td>-</td>
<td>-</td>
<td>29 (10.1)</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>-</td>
<td>-</td>
<td>0 (0)</td>
</tr>
<tr>
<td>American Indian</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>-</td>
<td>3 (1)</td>
</tr>
<tr>
<td>Multiethnic</td>
<td>-</td>
<td>-</td>
<td>34 (11.8)</td>
</tr>
<tr>
<td>Alcohol Problems</td>
<td>3.33</td>
<td>4.13</td>
<td></td>
</tr>
<tr>
<td>Reinforcement</td>
<td>0.16</td>
<td>0.19</td>
<td></td>
</tr>
<tr>
<td>Alcohol Use (drinks per week)</td>
<td>5.15</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>AUC</td>
<td>.10</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Expectancies</td>
<td>14.89</td>
<td>2.44</td>
<td></td>
</tr>
</tbody>
</table>

*Note: AUC = Area Under the Curve*
Table 2. Correlations Among All Variables

<table>
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<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gender</td>
<td>-</td>
<td>0.06</td>
<td>0.08</td>
<td>-0.09</td>
<td>0.06</td>
<td>-0.09</td>
<td>-0.07</td>
<td>0.02</td>
</tr>
<tr>
<td>2. Age</td>
<td>-</td>
<td>0.01</td>
<td>0.06</td>
<td>0.15*</td>
<td>0.03</td>
<td>0.12*</td>
<td>-0.07</td>
<td></td>
</tr>
<tr>
<td>3. Race</td>
<td>-</td>
<td>-0.06</td>
<td>0.03</td>
<td>-0.12</td>
<td>-0.07</td>
<td>-0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Alcohol Problems</td>
<td>-</td>
<td></td>
<td>.44**</td>
<td>.66**</td>
<td>.31**</td>
<td>.27**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Relative Reinforcement</td>
<td>-</td>
<td></td>
<td>.54**</td>
<td>.37**</td>
<td>.23**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Alcohol Use (drinks per week)</td>
<td>-</td>
<td></td>
<td>.35**</td>
<td>.23**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. AUC</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.21**</td>
<td></td>
</tr>
<tr>
<td>8. Alcohol Expectancies</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Note: AUC = Area Under the Curve

*p<.05*  *p<.001**
<table>
<thead>
<tr>
<th></th>
<th>IND</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alcohol Demand:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Effect</td>
<td>.18*</td>
<td>.08</td>
</tr>
<tr>
<td>Total Indirect Effect</td>
<td>.12*</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Relative Reinforcement:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Effect</td>
<td>.39**</td>
<td>.09</td>
</tr>
<tr>
<td>Total Indirect Effect</td>
<td>.27**</td>
<td>.06</td>
</tr>
</tbody>
</table>

$p<.05$  $p<.001$**
APPENDIX B: IRB STUDY APPROVAL
EXEMPTION DETERMINATION

January 5, 2021

Dear Lidia Mesheha:

On 1/5/2021, the IRB determined the following submission to be human subjects research that is exempt from regulation:

<table>
<thead>
<tr>
<th>Type of Review</th>
<th>Initial Study, Category 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>College Student Health Choices Survey</td>
</tr>
<tr>
<td>Investigator</td>
<td>Lidia Mesheha</td>
</tr>
<tr>
<td>IRB ID</td>
<td>STUDY00002590</td>
</tr>
<tr>
<td>Funding</td>
<td>None</td>
</tr>
<tr>
<td>Grant ID</td>
<td>None</td>
</tr>
</tbody>
</table>

Documents Reviewed:
- Consent Form Revised 1.5.21, Category: Consent Form
- HRP-255-Protocol FORM - Request for Exemption, docx, Category: IRB Protocol
- Measures 12.22.20, docx, Category: Survey / Questionnaire

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please submit a modification request to the IRB. Guidance on submitting Modifications and Administrative Check-in are detailed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2501 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

[Signature]

Rashe Jacques, Ph.D.
Designated Reviewer
Tatiana,

This email is to confirm that the IRB approved study (attached) resulted in the data used for your Masters Thesis.

Lidia

Lidia Z. Meshesha, PhD
Assistant Professor
Director, DREAM Lab
Department of Psychology
University of Central Florida
Orlando, FL 32816
lidia.meshesha@ucf.edu

Please note: Florida has a very broad open records law (F.S. 119). Emails may be subject to public disclosure.

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Demographics

1. Gender
   a. Male
   b. Female
   c. Transgender

2. Years of age

3. What term(s) best describes your race/ethnicity?
   a. White/Caucasian
   b. Hispanic/Latino(a)
   c. Asian
   d. Black/African American
   e. Native Hawaiian/Other Pacific Islander
   f. American Indian/Alaska Native
   g. Other: Please Specify

4. What is your current weight in pounds?

5. What is your current height?
   a. Feet:
   b. Inches:

6. What year in school are you?
   a. First year
   b. Sophomore
   c. Junior
d. Senior

e. Graduate Student

f. Not currently enrolled

g. Other:

7. Do you belong to a fraternity or sorority?
   a. Yes
   b. No

8. Where are you living? (Choose all that apply)
   a. Residence hall or other university housing
   b. Fraternity or sorority
   c. House or apartment

9. With whom are you living?
   a. With roommates
   b. Alone
   c. With one or both parents, or other adult relatives
   d. Other

10. How many course credits are you registered for this semester?

11. How many classes, if any, did you fail OR drop in the last academic semester?
   a. N/A, I was not a student last semester
   b. 0
   c. 1
   d. 2 or more
Daily Drinking Questionnaire

The questions below will ask about your alcohol consumption.

For the past month, fill in for each calendar day the number of standard drinks you usually drink on that day during a typical week, and the number of hours over which you consume this amount (i.e., the time from 1st sip to last sip). When we say one drink, we mean 12 oz. of beer, 5 oz. of wine, or 1.5 oz. of hard liquor (see picture on the left). Malt liquor is stronger than regular beer, so one 40 oz. Malt Liquor beverage such as Colt 45 counts as 5 standard drinks. Fill in an amount for each of the 7 days. If you do not typically drink on a given day, fill in 0 for that day.

<table>
<thead>
<tr>
<th></th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of drinks usually consumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

QUESTION FOR MALES ONLY:

IN THE PAST MONTH how many times have you had 5 or more drinks (in one occasion)?

QUESTION FOR FEMALES ONLY:

IN THE PAST MONTH how many times have you had 4 or more drinks (in one occasion)?
Adolescent Reinforcement Survey Schedule

The following is a list of activities, events, and experiences. For the time frame of the last 30 days, please indicate how often you have engaged in each activity, and how much you enjoyed each activity:

(1) **When you were not drinking alcohol or using drugs** (indicate in Frequency and Enjoyment without alcohol/drugs columns) and,

(2) **When you were drinking alcohol or using drugs** (indicate in Frequency and Enjoyment with alcohol/drugs columns).

If you have experienced an activity more than once in the past month, try to rate how enjoyable it was on average. Do not count tobacco, nicotine, or caffeine as drugs.

**Frequency:**

0 = 0 times 1 = once a week or less 2 = 2-4 times per week 3 = about once a day 4 = more than once a day

**Enjoyment:**

0 = unpleasant or neutral 1 = mildly pleasant 2 = moderately pleasant 3 = very pleasant 4 = extremely pleasant
<table>
<thead>
<tr>
<th>Activity</th>
<th>Frequency without alcohol/drugs</th>
<th>Enjoyment without alcohol/drugs</th>
<th>Frequency with alcohol/drugs</th>
<th>Enjoyment with alcohol/drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go places with dates or potential romantic partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talk with dates or potential romantic partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go out to eat with dates or potential romantic partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flirt with dates or potential romantic partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get compliments from dates or potential romantic partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go on dates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kiss dates or potential romantic partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise or participate in sports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go out to eat with friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talk with same sex friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go places with friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Column 1</td>
<td>Column 2</td>
<td>Column 3</td>
<td>Column 4</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Go for a walk with friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talk on the phone with friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go to parties with friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talk with friends about day's activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get compliments from friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meet new people my age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go hang out where friends meet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interact with people of own age and sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write email, text messages, or letters to friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go places with siblings or family members</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talk with siblings or family members</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go out to eat with siblings or family members</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tell secrets to siblings or family members</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spends weekends/vacations with siblings/family</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caressing with a date/romantic partner</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>Oral sex with a date/romantic partner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual intercourse with a date/romantic partner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekends/vacations with romantic partner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Going to school</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Studying</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doing chores at home</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Alcohol Purchase Task

Please respond to these questions as if you were actually in this situation. Imagine that you are in a **TYPICAL SITUATION** when you drink alcohol.

Imagine where you typically drink, what you typically drink, and who you typically drink with, if anyone.

The following questions ask how many drinks you would consume if they cost various amounts of money. The available drinks are standard size beer (12 oz.), wine (5 oz.), shots of hard liquor (1.5 oz), or mixed drinks containing one shot of liquor.

Assume that you did not drink alcohol before you were making these decisions, and will not have an opportunity to drink elsewhere after making these decisions.
In addition, assume that you would consume every drink you request; that is, you cannot stockpile drinks for a later date or bring drinks home with you.

1. How many drinks would you consume if they were FREE?
2. How many drinks would you consume if they were $0.25 each?
3. How many drinks would you consume if they were $0.50 each?
4. How many drinks would you consume if they were $1 each?
5. How many drinks would you consume if they were $1.50 each?
6. How many drinks would you consume if they were $2 each?
7. How many drinks would you consume if they were $2.50 each?
8. How many drinks would you consume if they were $3 each?
9. How many drinks would you consume if they were $4 each?
10. How many drinks would you consume if they were $5 each?
11. How many drinks would you consume if they were $6 each?
12. How many drinks would you consume if they were $7 each?
13. How many drinks would you consume if they were $8 each?
14. How many drinks would you consume if they were $9 each?
15. How many drinks would you consume if they were $10 each?
16. How many drinks would you consume if they were $11 each?
17. How many drinks would you consume if they were $12 each?
18. How many drinks would you consume if they were $13 each?
19. How many drinks would you consume if they were $14 each?
20. How many drinks would you consume if they were $15 each?
Brief Young Adult Alcohol Consequences Questionnaire

Below is a list of things that sometimes happen to people either during, or after they have been drinking alcohol. Next to each item below, please mark an “X” in either the YES or NO column to indicate whether that item describes something that has happened to you IN THE PAST MONTH.

In the past month...
1. While drinking, I have said or done embarrassing things.
2. I have had a hangover (headache, sick stomach) the morning after I had been drinking.
3. I have felt very sick to my stomach or thrown up after drinking.
4. I often have ended up drinking on nights when I had planned not to drink.
5. I have taken foolish risks when I have been drinking.
6. I have passed out from drinking.
7. I have found that I needed 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.
8. When drinking, I have done impulsive things that I regretted later.
9. I’ve not been able to remember large stretches of time while drinking heavily.
10. I have driven a car when I knew I had too much to drink to drive safely.
11. I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.
12. My drinking has gotten me into sexual situations I later regretted.
13. I have often found it difficult to limit how much I drink.
14. I have become very rude, obnoxious, or insulting after drinking.
15. I have woken up in an unexpected place after heavy drinking.
16. I have felt badly about myself because of my drinking.
17. I have had less energy or felt tired because of my drinking.
18. The quality of my work or schoolwork has suffered because of my drinking.
19. I have spent too much time drinking.
20. I have neglected my obligations to family, work, or school because of drinking.
21. My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.
22. I have been overweight because of drinking.
23. My physical appearance has been harmed by my drinking.
24. I have felt like I needed a drink after I’d gotten up (that is, before breakfast).
Comprehensive Effects of Alcohol Questionnaire: Expected Effects

This questionnaire assesses what you would expect to happen if you were under the influence of alcohol. Mark a response from (1) disagree to (4) for agree, depending on whether or not you would expect the effect to happen to you if you were under the influence of alcohol. These effects will vary; depending upon the amount of alcohol you typically consume.

This is not a personality assessment. We want to know what you would expect to happen if you were to drink alcohol, not how you are when you are not sober. Example: If you are always emotional, you would not mark agree as your answer for the statement “I would be emotional” unless you expected to become MORE EMOTIONAL if you drank.

<table>
<thead>
<tr>
<th>If I were under the influence of alcohol:</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I would be outgoing</td>
<td>1</td>
<td>2</td>
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<tr>
<td>2. My senses would be dulled</td>
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<td>3. I would be humorous</td>
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<td>4. My problems would seem worse</td>
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<tr>
<td>5. It would be easier to express my feelings</td>
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<td>6. My writing would be impaired</td>
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<td>7. I would feel sexy</td>
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<td>8. I would have difficulty thinking</td>
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<td>9. I would neglect my obligations</td>
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<td>10. I would be dominant</td>
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<td>11. My head would feel fuzzy</td>
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<td>12. I would enjoy sex more</td>
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<tr>
<td>13. I would feel dizzy</td>
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<td>14. I would be friendly</td>
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<td>15. I would be clumsy</td>
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<td>16. It would be easier to act out my fantasies</td>
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<tr>
<td>17. I would be loud, boisterous, or noisy</td>
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<td>18. I would feel peaceful</td>
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<td>19. I would be brave and daring</td>
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<td>20. I would feel unafraid</td>
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<td>21. I would feel creative</td>
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<td>22. I would be courageous</td>
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<td>23. I would feel shaky or jittery the next day</td>
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<td>24. I would feel energetic</td>
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<td>25. I would act aggressively</td>
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<td>26. My responses would be slow</td>
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<td>27. My body would be relaxed</td>
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<td>28. I would feel guilty</td>
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<td>29. I would feel calm</td>
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<td>30. I would feel moody</td>
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<td>31. It would be easier to talk to people</td>
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<td>32. I would be a better lover</td>
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<td>33. I would feel self-critical</td>
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<td>34. I would be talkative</td>
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<td>35. I would act tough</td>
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<td>36. I would take risks</td>
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<td>37. I would feel powerful</td>
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<tr>
<td>38. I would act sociable</td>
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</tr>
</tbody>
</table>
REFERENCES


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