DISSERTATION

GOAL ORIENTATION AND ALCOHOL USE DURING THE TRANSITION TO COLLEGE

Submitted by

Allison M. Grant

Department of Psychology

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Doctoral Committee:

Advisor: Jennifer Harman

Mark Prince
Dan Graham
Nate Riggs

ABSTRACT

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Alcohol use peaks in early adulthood and rates are significantly higher among college students than their non-college attending peers. Negative alcohol-related outcomes are common among college drinkers. This longitudinal study aimed to reduce negative alcohol-related outcomes, indirectly, by promoting the salience of first-year students' academic goals. Students were randomly assigned to set academic goals or no goals (control) at the start of the fall 2014 semester. Alcohol-related cognitions, past-month alcohol use, negative consequences of drinking, self-control, goal importance, and goal commitment were measured at baseline. Students revisited their goals and completed the alcohol measures in three follow-up surveys. The Motivational Model of Alcohol Use provided structure for testing hypotheses that setting academic goals would be associated with reduced negative alcohol-related outcomes via the effect of condition on drinking motives (H1), self-control would moderate the associations between goal condition, alcohol-related cognitions, and negative alcohol-related outcomes (H2), and goal covariates would moderate the association between self-control, alcohol-related cognitions, and negative alcohol-related outcomes (H3). Longitudinal path models were estimated in Mplus using Bayesian methods. All models fit the data well, but provided limited support for the hypotheses. Setting academic goals did not influence negative alcohol-related outcomes, indirectly, however a meaningful and negative direct effect on negative alcohol-related outcomes was found. Self-control did not moderate the association between goal condition and negative alcohol-related outcomes. Finally, goal importance did not moderate the

association between self-control and negative outcomes via drinking motives. Setting academic goals represents a promising, but complex tool for preventing college alcohol misuse.

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TABLE OF CONTENTS

CHAPTER I: INTRODUCTION

Excessive alcohol use is a leading cause of preventable death in the United States (CDC, 2021); it accounts for 10% of deaths among working-age adults (Stahre et al., 2014) and an average of 2.8 million years of potential life lost, annually (CDC, 2021). Excessive alcohol consumption presents a heavy economic burden within the United States with cost estimates ranging from $223.5 billion in 2006 (Bouchery et al., 2006) and $249 billion in 2010 (Sacks et al., 2010). Importantly, binge-drinking (typically defined as consuming 4 or more drinks in about two hours for women or 5 or more drinks in about two hours for men or drinking behavior that leads to a blood alcohol concentration of at least 0.08 g/dL) accounts for over 75% of the economic costs associated with alcohol use (Sacks et al., 2010). Epidemiological research suggests alcohol use peaks in early adulthood (O'Malley, 2004; Maggs & Schulenberg, 2004) and rates of alcohol use and binge drinking are significantly higher among college students than their non-college attending peers (Blanco et al., 2008; Schulenberg et al., 2018; White et al., 2008). Importantly, college-bound high school students drink less heavily compared to their non-college bound peers, but engage in higher rates of heavy drinking once in college (O'Malley & Johnston, 2002). Thus, it is critical to focus prevention efforts on this portion of the population, and the transition to college may represent a unique opportunity to impact college alcohol use and reduce negative alcohol-related harms.

Approximately 80% of college students drink alcohol, between 33% and 50% binge drink, and 35% have been drunk in the past 30 days (NIAAA, 2012; Schulenberg et al., 2018). Indeed, college student alcohol consumption is so pervasive that it has arguably become developmentally normative behavior. Accordingly, researchers have referred to alcohol use as a

"culturally sanctioned prerogative of older adolescents and young adults" (Schulenberg et al., 1996 pg. 289) and even a "rite of passage" among college students (Griffin, 2009, pg. 87; Vicary & Karshin, 2002, pg. 309). Although alcohol consumption may be normative among college students, alcohol use often results in negative consequences (Hingson et al., 2009; Hoeppner et al., 2012; Merrill et al., 2017; Schulenberg et al., 2018; White & Hingson, 2013; Wood et al., 2000). Merrill and colleagues (2017) found as many as 51% of college drinkers experience negative consequences of drinking on a weekly basis in their first semester of college. Consequences of alcohol use range in frequency and severity, however; the health consequences of excessive drinking within this population are staggering. Each year approximately 2.7 million college students drive under the influence of alcohol, 1,800 students die from unintentional, alcohol-related injuries, 600,000 students are injured while under the influence of alcohol, 646,000 students are assaulted by a peer who is under the influence of alcohol, 97,000 students suffer alcohol-related sexual abuse, and 400,000 students have unprotected sex (Hingson et al., 2009).

Moreover, approximately 25% of college students report that alcohol use interferes with their academic performance (Hoeppner et al., 2012; White & Hingson, 2013) and research shows alcohol consumption is negatively associated with multiple indicators of academic success in college (Singleton, 2007; Wood et al., 2000). For example, alcohol consumption is negatively correlated with college GPA even after controlling for SAT scores and high school class rank (Singleton, 2007). Further, heavy college drinking is negatively associated with educational attainment six years post matriculation (Wood et al., 2000).

In 2002, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) released a call to action for Changing the Culture of Drinking at U.S. Colleges. This call was followed up

with a broader call to action from the office of the Surgeon General of the United States to Prevent and Reduce Underage Drinking (USDHHS, 2007). These calls to action prompted extensive research and generated vast, new knowledge in the field of alcohol research. However, despite decades of intensive research and the development of theoretically supported intervention efforts, rates of college alcohol consumption and alcohol-related consequences remain unacceptably high within the college student population (Schulenberg et al., 2018; White & Hingson, 2013). Innovative research is needed to understand the persistence of college student drinking and inform effective intervention and prevention programs.

Many existing evidence-based prevention programs that aim to reduce college alcohol consumption remain individually-focused, and thus require screening, identifying, and delivering targeted interventions to problem drinkers (Borsari, 2014; Kilmer et al., 2014; NIAAA, 2002). Individually focused intervention programs are thus costly and may not promote students' academic goals which are important to students and predict student retention and success (Buote et al., 2007; Chemers et al., 2001; Griffin, 2009; Upcraft, 2002). The purpose of this project was to implement and evaluate a theoretically informed, universal prevention program that aims to reduce college alcohol consumption and alcohol-related consequences, indirectly, by promoting the salience of first year students' goals.

Predictors of Alcohol Use

A myriad of relevant predictors has been examined at the individual and contextual levels (Borsari et al., 2007; Kuther & Timoshin, 2003; Meque et al., 2019), however, a thorough review of all predictors is beyond the scope of this project. Instead, I will focus here on individual-level predictors of college student alcohol use that are theoretically supported and amenable to change.

Specifically, I will review findings related to the influence of alcohol-related cognitions, self-control, and goal-orientation on college student alcohol consumption.

Alcohol-related cognitions. Researchers suggest that in addition to drinking and non-drinking goals, alcohol use will be determined, in part, by alcohol-related cognitions (Palfai & Weafer, 2006). Alcohol-related cognitions include alcohol expectancies or beliefs about the effects of alcohol (Brown et al., 1987; Smith, Goldman, Greenbaum, & Christiansen, 1995) and drinking motives or reasons for drinking (Cooper et al., 1992; Kuntsche et al., 2008). According to Cox and Klinger (1988) drinking motives are the most proximal predictor of alcohol use and are influenced, in part, by expected and desired outcomes of alcohol use. Research has shown that drinking motives and alcohol expectancies explain approximately half of the variance in drinking behaviors (Kuntsche et al., 2008), and that motives mediate the link between alcohol expectancies and drinking behaviors (Kuntsche et al., 2010). These alcohol-related cognitions have received extensive attention within the research literature because of their predictive validity, their proximity to alcohol use decisions, and because they are thought to be amenable to change (e.g., Borsari et al., 2007).

The Motivational Model of Alcohol Use (MMAU; Cox and Klinger, 1988; 2011), Social Learning Theory (Bandura, 1977), and Expectancy Theory (Goldman, et al., 1987) each support the importance of alcohol-related cognitions. According to Cox and Klinger (1988; 2011) a drinking episode, no matter how automated or conditioned, is still a volitional act that is the result of a motivated decision. The authors further suggest motives for drinking are grounded in the desire to attain certain affective outcomes; namely, to increase positive or decrease negative affect. The importance of past reinforcement experiences, expectancies, and the value placed on

expected outcomes is also central to the tenets of Social Learning Theory (Bandura, 1977) and Expectancy Theory (Goldman et al., 1987).

Outcome expectancies. In line with Social Learning Theory (Bandura, 1977), research has shown alcohol expectancies can be learned through direct experience or vicariously, through observation as alcohol expectancies have been found among youth with little to no drinking experience (Christiansen et al., 1982; Miller et al., 1990). Miller and colleagues' findings also suggest alcohol expectancies increase over time. Importantly, alcohol expectancies predict heavy and problem drinking behaviors (Brown, 1985; Jones et al., 2001; Wood et al., 2001). Further, expectancies can be positive (i.e., sociability; liquid courage) or negative (i.e., risk and aggression; cognitive and behavioral impairment) in nature (Fromme et al., 1993; Stacy et al., 1990).

In their review of the alcohol expectancies literature, Jones et al. (2001) found positive expectancies are consistently associated with heavy drinking, alcohol-related problems, and alcoholism. Jones et al. also reviewed empirical evidence that suggests priming positive expectancies leads to increased alcohol consumption in both the laboratory and naturalistic settings; the opposite is found when participants are primed with negative expectancies. These findings affirm the importance of considering alcohol expectancies, and of giving special attention to the impact of positive alcohol expectancies.

Drinking motives. Cox and Klinger's Motivational Model of Alcohol Use (1988; 2011) outlines four affective motives for drinking to reduce negative or enhance positive affect through the instrumental or pharmacological effects of alcohol. In 1994, Cooper further revised her drinking motives questionnaire and identified a four-factor model of drinking motives. The factors outlined in Cooper's model include coping, conformity, enhancement, and social drinking

motives. Cooper suggests these motives align with Cox and Klinger's (1988; 2011) MMAU as follows: coping and conformity motives exemplify drinking to reduce negative affect through pharmacological and instrumental effects, respectively; enhancement and social motives exemplify drinking to enhance positive affect through pharmacological and instrumental effects, respectively. Cox and Klinger (2011) confirm that these drinking motives correspond approximately with the broader motive categories put forth by their model.

Similar to alcohol expectancies, drinking motives are thought to be either positive (social and enhancement motives) or negative (coping and conformity motives) in nature (Kuntsche et al., 2005). Drinking motives are also highly predictive of drinking behaviors including alcohol-related problems and consequences (Ham et al., 2007; Vaughan et al., 2009), peak past-month alcohol use (Lewis et al., 2008), and problematic or binge drinking (Hussong, 2003; Maggs, 1997; O'Connor & Colder, 2005). Research suggests that coping, enhancement, and social motives are more closely linked with alcohol use and related outcomes compared to conformity motives (Kuntsche et al., 2005; van Damme et al., 2013). Given their proximity to drinking behaviors and the fact that motives are influenced by both alcohol expectancies and desired outcomes, drinking motives are critical to consider when examining college student alcohol use.

Self-control. Baumeister and Vohs (2004) define self-control (or self-regulation) as the ability of the self to control oneself (behaviorally, emotionally, cognitively, etc.) in order to live up to one's standards. Baumeister and Vohs suggest that although opinions vary, the terms self-regulation and self-control can be used interchangeably. I will follow their lead and use these terms interchangeably throughout this document. Several theories of self-control have been introduced over time (Bandura, 1986; Carver & Scheier, 1982; Gollwitzer, 1990). MacKenzie et al. (2012) posit that within each of these theories, the principal processes that promote self-

controlled behavior include goal identification and adoption, monitoring and evaluating one's behavior in relation to goal progress, and changing one's behavior (when needed) to promote goal achievement.

The loss or reduction of one's ability to exert behavioral control is central to the concept of addiction. Thus, it comes as no surprise that the association between self-control and alcohol use among college students is well established. Low levels of self-control are associated with increased alcohol use, binge drinking, and negative alcohol-related outcomes (Bogg et al., 2012; Gibson et al., 2004; Leeman & Wapner, 2001; Pearson et al., 2013; Tibbetts & Whittimore, 2002; Williams & Ricciardelli, 1999). Higher levels of self-control, on the other hand, are associated with increased use of protective behavioral strategies, decreased alcohol consumption, and fewer negative alcohol-related consequences over time (D'Lima et al., 2012; Hustad et al., 2009; Pearson et al., 2013; Quinn & Fromme, 2010; Werch & Gorman, 1988). Several studies suggest that among adolescents and young adults, drinking restraint is negatively associated with self-control and positively predicts alcohol use, binge drinking, and alcohol-related problems (Lyvers et al., 2010; Ricciardelli et al., 2001; Williams & Ricciardelli, 1999). Drinking restraint aligns with Baumeister and Heatherton's (1996) characterization of misregulation in that it represents a preoccupation with alcohol use that leads to excessive consumption (Ricciardelli et al., 2001; Williams & Ricciardelli, 1999).

Goals. Goals have been defined as "the object or aim of an action" (Locke & Latham, 2013, p. 4) or "internally represented desired states" (Day & Unsworth, 2013, p. 158). According to goal theory (Locke & Latham, 1990; 2013), goals can be further described in terms of their content (the desired outcome) and intensity (the level of effort and commitment required in setting and attaining the desired outcome). These authors also posit that a discrepancy between

one's present and desired performance is produced when goals are identified, and individuals are motivated to reduce such discrepancies in an effort to attain their goals.

The goals students report at matriculation may be related to subsequent alcohol consumption (Conti, 2000; Lecci et al., 2002; Maggs, 1997; Palfai, 2006; Palfai & Ralston, 2011; Rhoades & Maggs, 2006; Vaughan et al., 2009). Research suggests first-year students report the importance of social (e.g., establishing a new social network of support) and academic goals (e.g., wanting to achieve good grades) during the transition to college (Griffin, 2009; Maggs, 1997; Rhoades & Maggs, 2006; Simons et al., 2006; Upcraft, 2002; Vaughan et al., 2009). Cross-sectional and longitudinal studies have identified differences in the associations between social and academic goals and alcohol use behaviors among college students (Maggs, 1997; Rhoades & Maggs, 2006; Simons et al., 2006; Vaughan et al., 2009). Specifically, academic motives and goals are negatively associated with alcohol use intentions, consumption, binge drinking, and negative alcohol-related consequences, and social motives and goals are positively associated with the aforementioned outcomes (Maggs, 1997; Rhoades & Maggs, 2006; Vaughan et al., 2009). Thus, academic goals appear to act as a protective factor against college alcohol consumption and social goals may be a risk factor within the college student population.

Additional research on the effects of college students' broader life goals indicates that students who report greater meaning and feel socially supported with respect to their goals consume less alcohol, report fewer motives for drinking, fewer alcohol-related problems, and increased motives to limit alcohol consumption (Lecci, et al., 2002; Palfai & Ralston, 2011; Palfai et al., 2011; Palfai & Weafer, 2006). Palfai and Weafer (2006) found lower levels of goal meaning were associated with increased alcohol consumption and negative alcohol-related consequences. Subsequent studies replicated this finding and found motives to limit alcohol

consumption (Palfai & Ralston, 2011) or enhancement motives (Palfai et al., 2011) mediated the association. Conti (2000) found that students who reflected more on their college goals reported higher levels of intrinsic and extrinsic motivation as well as greater academic adjustment to college. Lecci and colleagues (2002) found that feeling socially supported in the pursuit of one's goals was negatively associated with social drinking motives, alcohol use, and negative consequences of drinking. Thus, the content of student's goals, the meaning they associate with them, and the degree to which they feel supported in their goal-striving can lead to different alcohol-related cognitions, behaviors, and outcomes.

Interventions that utilize goals directly related to alcohol consumption. Recognizing the influence of goals on alcohol consumption, researchers have examined their utility to limit or reduce use (Curtin et al., 2001; Lozano & Stephens, 2010). Findings from this research have demonstrated varied results. For example, Curtin and colleagues (2001) found goal setting and feedback were not associated with greater reductions in heavy alcohol consumption compared to participants who received just an assessment, information on heavy drinking, and strategies to reduce heavy drinking. Lozano and Stephens (2010), on the other hand, found participatively-set and assigned goals to reduce alcohol consumption led to reductions in alcohol use over time compared to participants in a no-goal/control condition; goal achievement outcomes did not differ between participants in the participatively-set versus assigned goal conditions.

The differences in the findings of these studies could be attributed to variations in the samples and methods used. Lozano and Stephens (2010) and Curtin et al. (2001) both recruited college students who reported drinking heavily and experiencing alcohol-related problems. However, Curtin and colleagues' eligibility criteria were more stringent and resulted in a sample that consumed more alcohol regularly. It is also possible that some participants in the sample

were dependent on alcohol and may have engaged in temptation restraint – a form of misregulation – to reduce their alcohol consumption. College students are immersed in a culture that is generally supportive of alcohol use (NIAAA, 2002) and studies suggest students experience more positive than negative consequences from drinking (Park, 2004; Park & Grant, 2005). Thus, intervention efforts that attempt to directly manipulate college students' alcohol consumption goals may elicit reactance, which is a state of reaction to perceptions of coercion (to limit, eliminate, or otherwise change one's behavior) that often results in increased engagement in the behavior that is the focus of perceived coercion (Brehm, 1966). Targeting goals that are both important to students, yet indirectly related to alcohol use may thus represent a better approach for reducing college alcohol use.

Interventions that utilize goals indirectly related to alcohol consumption. Researchers have examined the influence of activating goals that conflict with or are not supported by alcohol consumption (Correia et al., 2005; Meisel & Palfai, 2015; Murphy et al., 2012; Reynolds et al., 2011; Voss et al., 2021). For example, Correia and colleagues (2005) encouraged students in the experimental group to engage in more substance free activities (e.g., exercise and creative activities). Over time, these students reported less alcohol consumption compared to control group participants. Meisel and Palfai (2015) elected life goals and found the pursuit of life goals with greater meaning attenuated the effects of both injunctive norms and direct offers to consume alcohol on heavy episodic drinking. Murphy et al. (2012) examined the utility of adding a substance-free activity session (SFAS) to a brief motivational interviewing intervention. In the additional, one-on-one session, participants were encouraged to consider their academic and career goals as well as the degree to which alcohol use might undermine those goals. Participants were then encouraged to engage in more substance free activities. Inclusion of the SFAS was

associated with greater decreases in alcohol consumption at the one-month follow-up compared to participants in the comparison condition. Likewise, Reynolds and colleagues (2011) examined the efficacy of an intervention aimed to increase students' engagement in reinforcing activities that aligned with their personal values and goals. Self-monitoring of activity involvement was also encouraged. Compared to a control group, individuals in the intervention group reported fewer alcohol-related problems over the course of the academic semester. Finally, Voss and colleagues (2021) elicited moderate reductions in alcohol use among college students when the students envisioned positive life events related to the achievement of academic goals. These findings support Locke and Latham's proposition that "goals direct attention, effort, and action toward goal-relevant actions at the expense of nonrelevant actions" (1990, p. 265). It follows that if prevention programs can successfully orient students toward goals that conflict with or are not supported by drinking behaviors (e.g., academic goals), alcohol consumption and negative alcohol-related consequences should decrease.

Summary and limitations of existing findings

The research reviewed above suggests that college is, in itself, a risk factor for excessive alcohol consumption and negative alcohol-related outcomes (Blanco et al., 2008; CDC, 2021; Schulenberg et al., 2018; White, et al., 2008). Further, it is clear these outcomes are affected by several theoretically relevant and empirically supported constructs. College alcohol consumption is related to students' goals, such that academic goals and goals with greater meaning are more likely to act as a protective factor for alcohol use and related consequences (Maggs, 1997; Meisel & Palfai, 2015; Rhoades & Maggs, 2006; Simons et al., 2006; Vaughan et al., 2009; Voss et al., 2021). Additionally, reporting greater alcohol expectancies and drinking motives (especially positive expectancies and motives) is linked to increased alcohol consumption (Jones et al.,

2001; Kuntsche et al., 2005; Merrill & Carey, 2016; Merrill et al., 2016; van Damme, et al., 2013). Finally, alcohol consumption is related to students' self-control; lower levels of self-control and higher levels of drinking restraint (a form of misregulation) are associated with increased alcohol consumption including risky drinking behaviors and negative alcohol-related outcomes (Bogg, et al., 2012; Gibson, et al., 2004; Leeman & Wapner, 2001; Pearson, et al., 2013; Tibbetts & Whittimore, 2002; Williams & Ricciardelli, 1999).

One limitation of the research reviewed above is the sparse examination of causal mechanisms through which goals and self-control influence drinking behaviors and alcohol-related consequences. According to Locke and Latham (1990) setting goals prompts self-controlled behaviors including attention, effort, and persistence; individuals are more likely to attend to goal-oriented stimuli, expend effort to achieve their goals, and persist when goal-related conflicts arise. Protective behavioral strategies and drinking-related motives appear to be potential mediators (Murphy et al., 2012; Palfai & Ralston, 2011; Pearson et al., 2013). Pearson and colleagues (2013) found the association between self-control and alcohol consumption was partially mediated by protective behavioral strategies. Similarly, Murphy et al. (2012) found the association between goals and alcohol consumption were partially mediated by protective behavioral strategies. Palfai and Ralston (2011) found the effect of goal meaning on alcohol use was partially mediated by motives to limit drinking. Palfai et al. (2011) found those with lower levels of goal meaning reported greater enhancement motives and greater alcohol consumption. Lecci and colleagues (2002) found that feeling socially supported in the pursuit of one's goals was associated with reduced alcohol consumption and that this effect was partially mediated by reductions in social drinking motives. These findings suggest that self-control and goals may influence individuals' alcohol consumption by influencing their motives for drinking as well as

how they consume alcohol once they have begun drinking. However, the cross-sectional nature of the majority of these studies (Pearson et al., 2013; Palfai et al., 2011; Palfai & Ralston, 2011; Lecci et al., 2002) limits the interpretation of these mediation effects.

A related limitation of the existing research on the associations between students' goals and alcohol consumption is the lack of longitudinal studies. Researchers suggest the effects of goals and self-control need to be studied longitudinally, as these processes unfold over time (Ashford & De Stobbeleir, 2013; Day & Unsworth; 2013); however, only three of the studies reviewed above utilized a longitudinal research design (Maggs, 1997; Murphy et al., 2012; Vaughan, et al., 2009) and the length of these studies varied substantially, from three weeks (Maggs, 1997) to two and one-half years (Vaughan et al., 2009). Although the longitudinal nature of their data would have allowed for additional insight into the mechanisms that underlie the goal orientation-alcohol use association, only one of these reports included meditational analyses (Murphy et al., 2012). These longitudinal studies also did not control for predictors that are known to influence goal achievement (e.g., self-control, commitment, etc.).

Another limitation of several of the studies reviewed above is related to how goals were assessed – typically via closed format questionnaires (Conti, 2000, Maggs, 1997; Rhoades & Maggs, 2006; Vaughan et al., 2009). Using closed format questions to assess student's goals limits the range of options from which students can select their goals (Reja et al., 2003) and reduces the level of cognitive engagement required of the participant (Ballou, 2008). Research and theory suggest individuals are both capable of setting their own goals (Lauver et al., 2008) and that self-set goals are positively associated with predictors known to enhance goal performance including intrinsic motivation, autonomous self-regulation, self-efficacy, attitudes,

beliefs, intentions, behavior, and effort (Boersma et al., 2006; Ryan & Deci, 2000; Taylor et al., 2006). A closer examination of the effects of self-set goals on alcohol consumption is needed.

A final limitation of the studies reviewed above is that relatively few actually manipulated students' goals, and none manipulated academic goals. The use of a correlational research design drastically limits our understanding of the relationships between students' goals and their alcohol-related cognitions, consumption, and consequences. For example, it is not clear if excessive alcohol consumption might lead individuals to place higher value on social goals or if the reverse is true. Thus, while it is clear that academic goals are negatively associated with alcohol use, evidence pertaining to the causality and directionality of this association is limited.

The limitations reviewed above suggest our understanding of the impact of goals on college alcohol use is incomplete. First, a closer examination of the causal associations between goal orientation and alcohol use is needed. An experimental manipulation of academic goal orientation would permit the use of causal arguments in stating the importance of students' goals in predicting their college alcohol consumption. Second, the limited examination of the causal mechanisms that underlie these associations warrants further attention. Theory suggests alcohol-related cognitions are the most proximal predictors of drinking behaviors (Cox & Klinger, 1988; 2011) and that life goals may conflict with alcohol use goals by "absorbing attention, time and energy that might otherwise be devoted to drinking activities" and "reducing the need to use alcohol for improving affect" (Cox et al., 2002, p. 280). It is thus important to consider whether the salience of academic goals might influence how individuals think about and use alcohol. Finally, studying the associations between goals, self-control, and alcohol-related cognitions longitudinally would both permit meditational analyses as well as further inform our

understanding of the evolving relationships between these constructs during the transition to college.

Purpose of the current project

This project aimed to manipulate first-year students' goal orientation to determine whether increasing the salience of academic goals affects alcohol-related cognitions, consumption, and consequences during the first semester of college. The role of self-control as a moderator of the effect of these associations was examined, and goal-related covariates, including goal commitment and importance, were accounted for in the intervention design and analyses. The longitudinal nature of this study will help address the issue of causality that limits the contributions of the extant literature. It will also allow for a more appropriate examination of causal mechanisms that underlie the effect of goal conditions on alcohol use outcomes.

Soon after the start of the fall semester, students were randomly assigned to create academic goals or to the control condition (which was not asked to set academic goals). Self-control and goal-related covariates were also measured. During each of three follow-up surveys, goal condition participants described their progress toward achieving their goals, goal-related barriers, and how they will move forward in their goal-striving. Theory suggests that increasing the salience of students' social or academic goals will prompt students to compare their current state and behaviors to their desired goals (Locke & Latham, 1990; 2013), which should, in turn, prompt behavioral adjustments (as needed) to promote goal attainment.

Given the empirical and theoretical evidence reviewed above, I hypothesize setting academic goals will be associated with reduced negative alcohol-related outcomes via the effect of goal condition on drinking motives (H1). Self-control is expected to moderate the associations between goal condition, alcohol-related cognitions and negative outcomes. Individuals with

higher levels of self-control are expected to experience fewer negative alcohol-related outcomes (H2). Finally, goal covariates are expected to moderate the association between self-control, alcohol-related cognitions, and negative alcohol-related outcomes. Individuals who endorse stronger commitment to and/or importance of their academic goals are expected to experience fewer negative alcohol-related outcomes (H3). See Figures 1-3 to review hypothesized conceptual models.

CHAPTER II: METHOD

Participants

The undergraduate psychology research pool at Colorado State University was used to recruit first-year students to participate in this study during the fall semester of 2014. Participants received course credit for their time and those who completed all four surveys were given a chance to win one of six $25 gift cards for Amazon.com.

Procedure

Baseline data was collected via an online survey at the start of the semester (early September) and follow-up surveys were also conducted online monthly thereafter (early October, November, and December) for a total of 4 waves of data. All participants (regardless of condition) were asked to complete each of the four surveys. Consenting participants were randomly assigned to one of two conditions: academic goals and no-goal/control. Goals and goal-related covariates were measured for goal condition participants during the first wave of data collection. In the subsequent waves of data collection, goal condition participants were reminded of the goals they created at the start of the study and asked questions related to their progress in achieving those goals. Alcohol-related cognitions, consumption, and consequences were measured among participants in both study conditions during all waves of data collection. Surveys across conditions were identical other than the goal-related measures and items; control condition participants did not fill out any additional survey items or measures.

Measures

Demographic and control variables. Demographic variables including age, sex, and ethnic/racial background were assessed. Additionally, recent alcohol use was measured using the

quantity/frequency method (Sobell & Sobell, 2003). Specifically, participants were asked "During the last six months, how many days on average did you drink alcohol?" and "When you drank alcohol, on average how many standard alcoholic beverages did you drink?" Participants who reported they had not consumed any alcohol in the past six months were not asked any other questions related to alcohol use (including alcohol-related cognitions).

Goal-related measures.

Academic goals. Goals were assessed using a variation of Little's (1983) personal projects analysis (PPA) method. Little's PPA procedure utilizes a multi-phased approach for identifying, refining, rating, and examining goals. In the first phase, participants are encouraged to list as many personal projects as they can. Then, participants are asked to list just 10 personal projects in the second phase; if they have more than 10, they are encouraged to select the ones they are most likely to work on in the next month. In the third phase, participants rate their projects on 17 dimensions (e.g., importance, difficulty, control, enjoyment, time adequacy, outcome, etc.). Participants are also asked to write down the names of individuals who may be involved in each project. In the final phase, participants indicate the settings (if applicable) in which they would engage in their projects.

One benefit of using the PPA method is its flexibility regarding the types of goals and goal-related covariates one wishes to assess (Presseau et al., 2008). Modified versions of Little's (1983) PPA method have been used to study goals related to several health behaviors including alcohol consumption (Lecci et al., 2002; Palfai & Ralston, 2001; Palfai & Weafer, 2006). Primary modifications include limiting the number of goals selected and the number of dimensions on which goals are rated (Lecci et al., 2002; Palfai & Ralston, 2011). In this study, a modified PPA method was used; participants were asked to list three academic goals they

planned to work on during the current semester and these three goals were subsequently rated on two dimensions: goal importance and goal commitment.

Goal importance. To assess goal importance, for each goal, participants were asked a series of questions (outlined in Appendix I). Responses to this question were used as a control variable in the analyses. The first question is taken from Little's (1983) PPA. The remaining open-ended questions were intended to promote participants' cognitive engagement in considering the importance of their goals as well as how achieving their goals will help them to achieve broader, life goals. For example, participants were asked, "Please describe why this academic goal is important to you (list at least one reason)."

Goal commitment. Goal commitment is a key component of goal theory (Locke & Latham, 1990) and was measured using the brief version of Hollenbeck et al.'s (1989) goal commitment scale (Appendix II). Using a 7-point Likert scale (with response options ranging from strongly disagree to strongly agree", participants indicate their level of agreement with items such as, "I am strongly committed to pursuing this goal" and "I think this is a good goal to shoot for". The brief version of this measure was identified by Klein et al. (2001) through item-level meta-analyses and multi-sample confirmatory factor analyses. Goal commitment was measured, separately, for each of the three goals they listed in the PPA.

Goal progress (follow-up). In waves two through four, participants were reminded of the academic goals they endorsed in wave one and asked to describe their progress towards achieving these goals with questions like, "Please describe your progress towards achieving your goals". The full set of questions is listed in Appendix III.

Self-control. Self-control was measured using Tangney, Baumeister, and Boone's (2004) brief measure of self-control (Appendix IV). Respondents indicate how much statements such as,

"I wish I had more self-discipline" or "I am able to work effectively toward long-term goals" reflect how they typically are on a 5-point Likert scale (with response options ranging from "not at all" to "very much". According to Tangney and colleagues, this measure is a psychometrically sound measure of trait self-control, with high test-retest reliability (r = .87), internal consistency (Cronbach alpha = .85), and construct validity.

Alcohol Use. During each wave of data collection, past-month alcohol use was measured with the 30-day Timeline Follow-Back method (TLFB) (Sobell & Sobell, 2000; Appendix V). The TLFB is widely used within the alcohol research literature (Hoeppner et al., 2010) and is valued for its ability to capture detailed daily drinking behaviors. The assessment involves asking participants about their exact amount of alcohol use within each day across the past 30 days. To aid in their recall, participants are encouraged to consider recent events such as birthdays, visits from friends or family, holidays, and doctor's visits. The self-administered, computerized TLFB has been shown to be highly reliable (Sobell et al., 1996) and has demonstrated criterion, construct, and content validity (NIAAA, 2003).

Alcohol Expectancies. The Comprehensive Effects of Alcohol Questionnaire (CEOA) (Fromme et al., 1993) was used to assess alcohol expectancies (Appendix VI). The CEOA includes 38 items and seven subscales including sociability, tension reduction, liquid courage, sexuality, cognitive and behavioral impairment, and risks and aggression. Using a 4-point Likert scale, participants are instructed to rate their level of agreement with items such as "When I drink alcohol, I expect that I would be outgoing" (sociability subscale) and "When I drink alcohol, I expect that I would feel sexy" (sexuality subscale). Response options ranged from *disagree* to *agree*. In addition to reliability (test-retest correlation coefficients range from .66 to .88 across the seven subscales), this measure has demonstrated construct and criterion validity.

Drinking Motives. The Drinking Motives Questionnaire-Revised (DMQ-R) was used to assess drinking motives (Cooper, 1994; Appendix VII). The DMQ-R is the most frequently used and highly recommended measure of drinking motives (Kuntsche et al., 2005). The measure includes 20 items with four subscales (social, conformity, enhancement, and coping motives). Example items include "I drink to be sociable" (social subscale) and "I drink because it makes me feel good" (enhancement subscale). Responses are rated on a 5-point Likert scale ranging from *Almost never/Never* to *Almost always/Always*. The measure has demonstrated internal reliability (alpha coefficients for the subscales range from .84 to .88) and construct validity (Cooper, 1994).

Negative Consequences of Drinking. The Rutgers Alcohol Problem Index (RAPI) was used to assess negative consequences of drinking (White & Labouvie, 1989; Appendix VIII). In completing the RAPI, participants are asked to respond to 18 items that assess the negative consequences they have experienced in the past year as a function of their alcohol consumption. Example items include "Not able to do your homework or study for a test" and "Suddenly found yourself in a place that you could not remember getting to". Items are rated on a 4-point Likert scale with response options ranging from *None* to *More than five times.* This measure demonstrates high reliability (test-retest, split-half, and internal consistency) and criterion and construct validity (NIAAA, 2003).

Data Analysis

To examine mechanisms of change in drinking behaviors, I estimated path models using Mplus version 8 (Muthén & Muthén,1998-2017). I used a longitudinal path analysis framework to test each of my hypotheses (see Figures 1-3 to review hypothesized conceptual models). By incorporating variables measured at all four waves of the study in path models that employed

sequential mediation, the longitudinal nature of these models meets several of the criteria outlined in Nock's 2007 paper on evaluating mechanisms of change (specifically, association strength, temporality, experimental manipulation, plausibility and coherence, consistency, and criteria in concert). Perhaps the greatest strength of this approach is the temporal precedence I was able to assess between predictors, mediators, and outcome variables; a key criterion for assessing causal relationships (Baron & Kenny, 1986; Gelfand et al., 2009; MacKinnon et al., 2007).

My path analyses employed sequential mediation (2+ mediators). Mediation analyses test whether a putative mechanism of change explains how a predictor variable affects an outcome variable. In hypothesis 1, I aimed to show that condition (predictor) influences negative consequences of drinking (outcome) via drinking motives (mediator). I examined the effect via drinking motives alone as well as via drinking motives (mediator #1) and alcohol use (mediator #2). I also used moderated mediation to examine the conditional indirect effects of a predictor variable on an outcome variable via mediator(s). Specifically, in hypothesis 2, I aimed to show that the effect of condition (predictor) on negative consequences of drinking (outcome) via drinking motives (mediator) is conditional upon baseline levels of self-control (moderator). I examined this indirect effect via drinking motives alone (one mediator), as well as with alcohol use (sequential mediation). In hypothesis 3, I aimed to show, among participants in the academic goal condition, the effect of self-control (predictor) on negative consequences of drinking (outcome) via drinking motives (mediator) is conditional upon baseline levels of goal covariates (moderator). As before, these effects were examined via drinking motives alone as well as via drinking motives and alcohol use.

A Bayesian estimator with noninformative priors was employed because it performs better with smaller samples, nonnormally distributed data, and reduces type I errors (Tofighi & Kelley, 2020). For all models, fit was assessed with the posterior predictive p-value (PPP) and the associated 95% confidence interval. Posterior predictive testing compares the data created by the model parameters (the posterior distribution) with the actual data. If the posterior distribution matches the observed data well, the resulting PPP value will be near .5 indicating excellent fit (Muthén & Asparouhov, 2012; van de Schoot et al., 2014). Further evidence of good model fit is a 95% confidence interval that centers around zero with a negative lower bound and a positive upper bound. A PPP value below .10 is considered a poor fitting model (Cain & Zhang, 2018; Muthén & Asparouhov, 2012). Nonsignificant predictor variables were trimmed from the models when the variable was not of substantive interest for parsimony (Kelloway, 2015).

Recommendations for estimating indirect effects have evolved over time (Baron & Kenny, 1986; Fairchild & McDaniel, 2017; Preacher & Hayes; 2004; Sobel, 1982; Tofighi & Kelley, 2020; Tofighi & MacKinnon, 2011). Thus, mediation was tested using the product of coefficients method (MacKinnon, 2000). Further, it has been established that the product of coefficients approach violates the normality assumption (van de Schoot et al., 2014); therefore, Bayesian credibility intervals (CrI) were used to examine temporal mediation effects, which have been shown to be robust to violations of normality (Tofighi & Kelley, 2020; van de Schoot et al., 2014); such effects were deemed significant when the Bayesian credibility interval did not contain 0.

CHAPTER III: RESULTS

Sample Description

A total of 489 first-year students were recruited for this study (*n* = 489, 340 female); however, only participants who reported having consumed alcohol at baseline and were under 25 years old (*n* = 352, 243 female) were retained for the purposes of the present analyses. Students aged 25-33 years old (*n* = 5) were dropped from the present analyses because young adults undergo significant brain maturation that is typically complete by the time they reach 25 years of age (Arain et al., 2013; Gavin et al., 2009; Giedd & Rapoport, 2010).

My final sample ranged in age from 17 to 24 years old (*M* = 18.5, *SD* = 1) and most identified as White/Caucasian (77.6%), followed by Hispanic/Latino (9.4%), Other (4.3%), Asian (3.7%), Black/African American (4%), American Indian/Native American (0.6%), and Pacific Islander (0.6%). Participants were randomly assigned into the academic goal or no goal/control conditions (*n*s = 175 and 177, respectively). There were no significant differences at baseline between conditions for any of the hypothesized variables.

Attrition was within a reasonable range (Hanna et al., 2014; Teague et al., 2018); between 19 and 23% of participants did not take one or more of the follow-up surveys. Table 1 provides rates of attrition by condition across waves of data collection. T-tests were used to assess the influence of hypothesized model variables (condition, drinking motives, alcohol expectancies, alcohol use, negative consequences of drinking, sex, self-control, goal importance, and goal commitment) on attrition. A Bonferroni-corrected p-value (.005) was used to limit alpha-inflation due to multiple comparisons. None of the hypothesized model variables were

significantly related to attrition. Table 2 provides descriptive statistics for the predictor and outcome variables for participants in each condition.

Goals

A complete examination of students' goals is beyond the scope of this project; however, students' goals primarily centered on grades, attending classes, completing homework/studying, and time management. Specific examples of goals related to grades were "Maintain a minimum 3.6 GPA", "Get straight A's in all [of] my classes", and "Receive good grades". Specific examples of attending classes were "only miss class due to an emergency", "Make sure that I go to every class that I can", and "To attend every class". Examples of goals on completing homework/studying were "Complete all my homework on time", "I would like to make sure that I get all of my homework done on time. I would like to make sure that I get my homework done in the highest quality I can muster, so that I can keep good grades", "Complete all assignments on time", and "Spend more time studying". Examples of goals related to time management include "Stop procrastinating", "get my work done early [and] stop waiting till the last minute", and "I want to organize myself to better balance my school work". Additional goal categories include emotion regulation (e.g., "Not get so stressed out"), increasing involvement in co-curricular activities (e.g., "I want to join more clubs and hopefully hold a leadership position in at least one of them.") and engaged learning (e.g., "Learn things that have real life applications"). On average, students were largely committed to their academic goals; scores ranged from 2.93 to 7.00 ($M = 6.16$, $SD = .86$). They also tended to rate their goals as important; average goal importance scores ranged from 1 to 10 ($M = 8.79$, $SD = 1.51$). Average goal commitment and importance ratings were moderately correlated $r(168) = .42$, $p < .001$.

Alcohol Use

Participants consumed, on average, between 1 and 17 standard alcoholic drinks per drinking occasion. Average past-month alcohol use peaked at wave 3 with students reporting an average of 4.5 standard alcoholic drinks (*SD* = 2.12) per drinking occasion. Students reported experiencing between 0 and 22 negative alcohol-related consequences each month. Negative consequences also peaked at wave 3 with students reporting an average of 3.1 consequences (*SD* = 5.21). To test my hypotheses, I operationalized alcohol use as the product of average number of standard alcoholic drinks consumed per drinking occasion and the number of drinking days (Sobell & Sobell, 2003).

Path Models

Hypothesis 1. This path model tested the hypothesis that setting academic goals would be associated with reduced negative alcohol-related consequences via the effect of goal condition on drinking motives. The full conceptual path model can be reviewed in Figure 1, the final model with significant paths highlighted can be reviewed in Figure 4, and final model coefficients are in Table 3. The model fit the data well, *PPP* = .58, 95% CI [-8.23, 8.90]. Positive alcohol expectancies predicted drinking motives. Both positive alcohol expectancies and drinking motives predicted alcohol use. Alcohol use predicted negative alcohol-related outcomes. Two indirect paths predicted negative alcohol-related outcomes. In both paths, positive alcohol expectancies predicted negative alcohol-related outcomes via drinking motives and alcohol use and via just alcohol use. Goal condition did not influence alcohol-related outcomes indirectly via drinking motives β = -0.02 *SD* = 0.06, *p* = .31, 95% CrI [-0.15., 0.11] nor did it influence negative alcohol-related outcomes via drinking motives and alcohol use β = -0.01 *SD* = 0.04, *p* = .28, 95% CrI [-0.10, 0.06]. The direct effect of goal condition on negative alcohol-related outcomes was in the expected direction and trended toward statistical significance β = -0.69 *SD*

= 0.42, p = .08, 95% CrI [-1.42., 0.24]. These results failed to support my hypothesis but provided additional support for the MMAU (alcohol-related cognitions predict alcohol use and negative alcohol-related consequences).

Hypothesis 2. This path model tested the hypothesis that self-control would moderate the association between goal condition and negative alcohol-related outcomes via drinking motives. The full conceptual path model can be reviewed in Figure 2, the final model with significant paths highlighted can be reviewed in Figure 5, and final model coefficients are in Table 4. The model fit the data well *PPP* = .25, 95% CI [-6.68, 18.13]. Similar to the path model in the first hypothesis, positive alcohol expectancies predicted drinking motives and both positive alcohol expectancies and drinking motives predicted average alcohol use. Again, negative alcohol-related outcomes were predicted directly, via drinking motives and alcohol use. Similar to the path model in the first hypothesis, positive alcohol expectancies predicted negative alcohol-related outcomes via drinking motives and alcohol use and via just alcohol use. Unlike the path model for my first hypothesis, the indirect path from positive alcohol expectancies to negative alcohol-related outcomes via drinking motives, alone, was significant. There was no evidence of an interaction effect between self-control and goal condition β = -0.05 *SD* = 0.53, p = .18, 95% CrI [-0.17., 0.04]. There also was no evidence of conditional indirect effects between condition and negative alcohol-related outcomes via drinking motives β = -0.01 *SD* = 0.01, p = .18, 95% CrI [-0.03., 0.01] or via drinking motives and alcohol use β = -0.01 *SD* = 0.01, p = .18, 95% CrI [-0.02., 0.00]. As before, though, the direct effect of goal condition on negative alcohol-related outcomes was in the expected direction (negative) and the 95% credibility interval was largely negative (-1.46, 0.07). My hypothesis was not supported; however, my results, again, provide

support for the MMAU (alcohol-related cognitions predict alcohol use and negative consequences).

Hypothesis 3. The last path models tested the hypothesis that the effect of self-control on negative alcohol-related outcomes, via drinking motives, would be moderated by goal-related covariates (goal importance and commitment). These models were tested only with data from students in the academic goal condition because goal covariates were not measured in the control condition. Goal importance and commitment were tested in separate models to promote parsimony. The two models performed similarly in terms of direct, indirect, and conditional indirect effects. The goal importance model provided a better fit for the data and is reported here. The full conceptual path model can be reviewed in Figure 3, the final model with significant coefficients can be reviewed in Figure 6, and the final model coefficients are in Table 5. This model demonstrated excellent fit *PPP* = .50, 95% CI [-10.56, 16.58]. Similar to the prior models, positive alcohol expectancies predicted drinking motives; however, in this model, only drinking motives directly predicted alcohol use. Negative alcohol-related outcomes were predicted directly only via alcohol use, and, indirectly, by alcohol expectancies via drinking motives and alcohol use. The direct interaction effect of self-control and goal importance on drinking motives was not significant β = 0.00 *SD* = 0.03, *p* = .48, 95% CrI [-0.05., 0.05]. There was no evidence of moderated mediation; the indirect effect of self-control on negative alcohol-related outcomes, via drinking motives, was not moderated by goal importance β = 0.00 *SD* = 0.01, *p* = .46, 95% CrI [-0.02., 0.01]. Further, the indirect effect of self-control on negative alcohol-related outcomes, via drinking motives and alcohol use, was not moderated by goal importance β = 0.00 *SD* = 0.00, *p* = .48, 95% CrI [-0.01., 0.01]. This model failed to support my hypothesis.

CHAPTER IV: DISCUSSION

This project aimed to examine the effects of academic goal orientation on negative alcohol-related cognitions, alcohol use, and negative alcohol-related outcomes during the transition to college. I hypothesized that, by creating academic goals and revisiting those goals throughout the semester, students would experience fewer negative alcohol-related consequences. Drinking motives and alcohol use were expected to mediate this association, while self-control, goal importance, and goal commitment were expected to augment those indirect associations. My path models fit the data well but provided limited support for my hypotheses.

In my first path model, I tested the hypothesis that setting academic goals would be negatively associated with negative alcohol-related outcomes via the effect of goal condition on drinking motives. The direct effect of goal condition on drinking motives was not significant nor was the indirect effect on negative alcohol-related consequences. However, the direct effect was in the expected direction (negative) and the associated credibility interval was largely negative (ranging from -1.42 to 0.24). This finding suggests my intervention holds some promise and could represent a meaningful starting point for interventions aiming to influence negative alcohol-related outcomes indirectly via academic or other meaningful life goals.

The research literature provides substantial support for my hypothesis that creating academic goals would be associated with decreases in negative alcohol-related consequences (Boersma et al., 2006; Cox et al., 2002; Griffin, 2009; Lecci, et al., 2002; Locke & Latham, 1990; Maggs, 1997; Meisel & Palfai, 2015; Palfai & Ralston, 2011; Palfai et al., 2011; Palfai & Weafer, 2006; Rhoades & Maggs, 2006; Ryan & Deci, 2000; Simons et al., 2006; Taylor et al.,

2006; Vaughan et al., 2009; Voss et al., 2021), so it is perplexing that a significant effect of goal setting was not found. One possible explanation for this finding is my use of a modified version of Little's (1983) PPA to elicit and rate goals. Although researchers posit malleability is a strength of this method (Presseau et al., 2008), setting just three goals and rating those goals on only two broad attributes (commitment and importance) may have limited the intended impact of goal setting. At the same time, it is also possible the intervention's impact on alcohol-related cognitions was greater than anticipated and this led to significant variation in the data. Cognitive dissonance (Festinger, 1957) is a plausible outcome for this intervention. According to Festinger (1957), cognitive dissonance is a state of unpleasant arousal that is caused by conflicting cognitions and often results in motivation to reduce discomfort by increasing consistency in cognition (or achieving cognitive consonance). Some students may have been impacted in a significant and unexpected way by regularly reporting their alcohol-related cognitions, use, and negative consequences of alcohol use while considering their goal-striving. If students were struggling to attain their goals and felt their alcohol consumption was negatively affecting their goal-striving, it is feasible that they would develop a desire to restrain their alcohol consumption. Prior research has shown that drinking restraint is a form of misregulation that can lead to increased alcohol use (Ricciardelli et al., 2001; Williams & Ricciardelli, 1999). Although it is difficult to ascertain if one of these explanations (or some other variable or process) can account for my findings, the explanations posited here are interesting to consider and may prove useful avenues for future investigations.

In my second path model, I tested the hypothesis that self-control would moderate the association between goal condition and negative alcohol-related outcomes. This model was nearly identical to my first path model, except an interaction term was added to see if self-control

boosted the effect of goal condition on drinking motives. Measures of conditional indirect effects were also added to see if the additive effect of self-control and goal condition on drinking motives would carry through such that negative alcohol-related consequences were impacted. The model fit the data well, but I did not find evidence of moderation (self-control did not interact with goal condition) to impact drinking motives nor moderated mediation (the effect of self-control on goal condition did not influence negative alcohol-related consequences via drinking motives). My hypothesis was therefore not supported.

Again, existing research provides substantial support for my hypothesis; low levels of self-control are associated with increased alcohol use, binge drinking, and negative alcohol-related outcomes (Bogg et al., 2012; Gibson et al., 2004; Leeman & Wapner, 2001; Pearson et al., 2013; Tibbetts & Whittimore, 2002; Williams & Ricciardelli, 1999), and higher levels of self-control are associated with decreased alcohol consumption and fewer negative alcohol-related consequences over time (D'Lima et al., 2012; Hustad et al., 2009; Pearson et al., 2013; Quinn & Fromme, 2010; Werch & Gorman, 1988). It is therefore surprising that self-control did not facilitate the effect of goal condition on negative alcohol-related consequences. As before, it is possible there is significant variation (or noise) in the data from unexpected impacts of the intervention. If students in the academic goal condition were struggling with goals they cared a great deal about and felt their alcohol use was undermining the pursuit of those goals, it is possible the resulting cognitive dissonance might have resulted in efforts to restrain from consuming alcohol. Drinking restraint is a form of misregulation known to predict excessive alcohol consumption (Ricciardelli et al., 2001; Williams & Ricciardelli, 1999). Important for testing this hypothesis is the fact that college students with higher levels of trait self-control are likely more accustomed to achieving their academic goals (Tangney et al., 2004), and thus might

experience even greater cognitive dissonance if they believed their alcohol consumption was undermining their academic goal-striving. An interesting question to pursue in the future relates to students with higher levels of trait self-control and who engage in drinking restraint to see whether their capacity to engage in self-controlled behavior would dissipate (Baumesiter & Vohs, 2007) as quickly as it would for students with lower levels of trait self-control.

In my final path model, I tested the hypothesis that goal covariates would moderate the association between self-control, alcohol-related cognitions, and negative alcohol-related outcomes. Importantly, this model was tested with data only from participants in the academic goal condition because goal covariates were not measured for participants in my control condition. Goal importance and self-control did not have a significant multiplicative effect on drinking motives and did not indirectly affect negative alcohol-related consequences via drinking motives. These findings were unexpected, as research supports the premise that both goal covariates and self-control would influence negative alcohol-related outcomes (Bogg et al., 2012; D'Lima et al., 2012; Gibson et al., 2004; Hustad et al., 2009; Lecci, et al., 2002; Leeman & Wapner, 2001; Palfai & Ralston, 2011; Palfai et al., 2011; Palfai & Weafer, 2006; Pearson et al., 2013; Tibbets & Whittimore, 2002; Quinn & Fromme, 2010; Voss et al., 2021; Werch & Gorman, 1988; Williams & Ricciardelli, 1999). Given that this model was tested only for the academic condition participants (n = 175), it seems plausible it was underpowered to detect significant effects. Another possible explanation is that the multiplicative impact of self-control and goal importance led to an unexpected misregulation. As noted previously, cognitive dissonance was a possible outcome of this intervention and students with good self-control who identified academic goals that were important to them may have identified an association between their alcohol use and goal-striving while regularly reporting their alcohol-related

cognitions, use, and negative consequences of alcohol use as well as their goal-striving. Such an association might, understandably, be negative (if the student was struggling to attain their goals) and the resulting dissonance may have fostered a desire to limit alcohol consumption. Drinking restraint is a form of misregulation that can lead to increased alcohol use (Ricciardelli et al., 2001; Williams & Ricciardelli, 1999). Prevention scientists seeking to reduce alcohol use through similar means may wish to include measures of cognitive dissonance (Sweeney et al., 2000), motives to reduce alcohol use (Collins & Lapp, 1992; Elliot & Devine, 1994), and/or strategies to limit drinking (Werch & Gorman, 1986) to disentangle the complex cognitive processes and behaviors that may be elicited through such intervention efforts.

My hypotheses were not intended to test the relationships posited by Cox and Klinger's (1988; 2011) Motivational Model of Alcohol Use; however, I did leverage the MMAU as a sort of structural foundation for testing my hypotheses, so it seems important to reflect on those findings as well. My models were aligned very well with the primary tenets of the MMAU and the extant literature on alcohol-related cognitions (Brown, 1985; Cox & Klinger, 1988; 2011; Cooper, 1994; Jones et al., 2001; Kuntsche et al., 2008; Wood et al., 2001). Further, my models consistently fit the data well. My findings, thus, affirm, the predictive validity of the MMAU and suggests the MMAU provides a useful structural foundation for advanced statistical models.

Strengths

The use of experimental methodology, sound measures, a longitudinal design, and an advanced analytic approach bolsters the internal validity and causal inferences I am able to make with my findings. Experimental manipulation of an independent variable, the inclusion of a control group, and random assignment to conditions is the gold standard for understanding causal relationships between variables (Hariton & Locascio, 2018). Participants in my study were

randomly assigned to the goal setting or no-goal/control condition. Random assignment increases internal validity by minimizing the likelihood of threats such as selection effects and confounding variables. Minimizing threats to internal validity enhances my ability to make causal inferences regarding the effects of my experimental manipulation. Using reliable measures for assessing alcohol-related cognitions, alcohol use, negative alcohol-related consequences, and self-control further improves the internal validity of my study (Cooper, 1994; Fromme et al., 1993; Sobell & Sobell, 2000; Tangney et al., 2004; White & Labouvie, 1989). My study's internal validity and the causal inferences I am able to make are also bolstered by my use of a longitudinal survey design (collecting data at four separate time points over the course of students' first semester in college). Finally, I maximized the benefits of my longitudinal study design by incorporating data collected across all four timepoints in my path models to assess sequential mediation and moderated mediation. My use of Bayesian estimation within these models eliminates potential issues such as non-standard distributions and small sample size.

Limitations

Threats to External Validity. The inferences I can draw from this study are hindered by the generalizability of my sample. Minority students were underrepresented in the final sample and students were only eligible for recruitment if they were enrolled in introductory psychology courses at Colorado State University. It is possible findings may have differed had I been able to recruit participants from a wider range of classes and/or post-secondary institutions (e.g., at community colleges, private colleges, and institutions across a wider geographic region). While external validity may be limited vis-à-vis generalizability, my model paths did align with existing findings with regard to the Motivational Model of Alcohol Use (Brown, 1985; Cox & Klinger, 1988; 2011; Cooper, 1994; Jones et al., 2001; Kuntsche et al., 2008; Wood et al., 2001);

this increases my confidence in the validity of my findings and suggests a potential universality of the MMAU.

A related limitation is that my models did not account for race/ethnicity. While this was not the focus of my research, examining the associations between racial/ethnic background and alcohol-related cognitions, behaviors, and outcomes remains an important area for growth within the field of college alcohol research (Chartier & Caetano, 2010; Iwamoto et al., 2016). Stereotype threat (Pennington et al., 2016; Steele, 1997), institutional diversity (Barry et al., 2017; Gardner et al., 2020), perceptions of racism and discrimination (Grekin, 2012; Iwamoto et al., 2016; Thorpe et al., 2020), immigration history (Greene & Maggs, 2019), and participation in athletics (Mastroleo et al., 2018) are all correlates of minority students' alcohol-related cognitions, drinking behavior, and negative consequences. There is, however, notable variability in research findings. Though Barnett and colleagues (2014) found no differences by race/ethnicity in the number of negative consequences of alcohol use college students reported, other studies suggest belonging to a minority group may offer protective benefits against excessive alcohol use and negative alcohol-related consequences. For example, minority students reported higher levels of negative alcohol expectancies (Thorpe et al., 2020), lower levels of alcohol use (Greene &. Maggs, 2019; Thorpe et al., 2020), and were less likely to experience negative alcohol-related consequences (Mastroleo et al., 2018; Turner & Shu, 2004). Other research has shown black males consume more alcohol when enrolled in a predominantly white college (Barr et al., 2017) and an association between racism-related stress and alcohol-related consequences (Grekin, 2012). This aligns with research on stereotype threat, ego depletion, and alcohol use (DeHart et al., 2014; Pennington et al., 2016; Steele, 1997). Demographics information (including race/ethnicity and gender) was collected at the end of my study's first

survey in order to reduce the influence of stereotype threat. However, it remains unknown if minority students in this study were protected from excessive alcohol use and negative alcohol-related consequences by their racial/ethnic background or if they were at greater risk for excessive alcohol use and negative alcohol-related consequences due to the limited institutional diversity of Colorado State University and/or potential experiences with stereotype threat, racism, and discrimination.

Threats to Internal Validity. One threat to internal validity is my reliance on self-report measures of past behavior. Survey studies typically rely on participants' ability to accurately recall and report their past behavior and experiences; recall error is a noteworthy limitation of such methods. At each wave of data collection, participants were asked to recall behaviors and experiences over the prior 30 days. Using a shorter recall window (e.g., collecting data every two weeks rather than monthly) may have improved participants' ability to accurately recall and report alcohol-related cognitions, behaviors, and outcomes. However, my use of measures with excellent psychometric properties helps to limit concerns regarding recall error (Cooper, 1994; Fromme et al., 1993; Sobell & Sobell, 2000; White & Labouvie, 1989).

Social desirability effects may have also limited participants' capacity to accurately report their alcohol-related cognitions, drinking behaviors, and negative alcohol-related outcomes. Although alcohol use is extraordinarily common among first-year students and participants were assured their data would be kept strictly confidential, alcohol consumption was illegal for the majority of participants. It is possible feelings of shame or concerns about the confidentiality of survey responses may have made it difficult for some participants to accurately report their experiences with alcohol and negative alcohol-related consequences. Given the normative nature of college alcohol use, reassurances provided to participants regarding

confidentiality measures, and the fact that students reported substantial alcohol consumption and consequences, it is unlikely social desirability effects had a substantial impact on the internal validity of this study.

A final limitation of the present study is that I did not measure or control for outcomes such as cognitive dissonance, drinking restraint, protective behavioral strategies, or motives to limit drinking in my models. Including these variables in my models might have allowed for a more nuanced understanding of when and under what conditions goal setting might act in ways that prove beneficial or harmful for goal-setting participants.

Future Directions

Despite these limitations, my study provides useful insights on prevention programs that aim to reduce excessive alcohol consumption among first-year college students. Future explorations of goal setting and college alcohol use could examine the impact of goal setting through many lenses such as qualitative data, providing additional supports, or exploring additional cognitive and behavioral factors that may influence self-controlled behavior and alcohol consumption.

Qualitative data analysis could be helpful for understanding the extent to which participants may be aware of and/or willing to acknowledge their struggles with goal-striving. Participants could be asked to reflect on their goal-striving at regular intervals and analysis of the resulting qualitative data could provide insights on the potential emotional tolls of struggling to achieve or make progress on one's goals. If findings provided evidence that college students are capable of attributing their struggles with goal-striving to their alcohol use, this information could aid in the design of future intervention efforts.

A related direction for future lines of research on goal setting and alcohol use could be to build in supports for students who are asked to set, but are struggling to achieve their academic goals. Even in the context of web-based surveys, students could be presented with opportunities to request appointments with academic support services such as advising, career services, health, and/or counseling centers.

Last, future studies could examine cognitive and/or behavioral factors that may influence alcohol use in the context of goal setting. Given that achieving one's academic goals is particularly important to college students and college alcohol use is developmentally normative behavior, some students may experience significant cognitive dissonance if they become aware of the extent to which their alcohol use is interfering with or undermining their academic achievement. This dissonance has the potential to yield positive outcomes (reduced alcohol consumption and goal progress) or negative ones (restrained drinking which could result in excessive alcohol use). Researchers may wish to employ measures of cognitive dissonance (Sweeney et al., 2000), motives to reduce alcohol use (Collins & Lapp, 1992; Elliot & Devine, 1994), use of protective behavioral strategies (Martens et al., 2005) and/or strategies to limit drinking (Werch & Gorman, 1986) to disentangle the complex cognitive processes and behaviors that may be elicited through academic goal setting.

Conclusions

The deleterious impacts of excessive college alcohol use are widespread and costly, and creating scalable cost-effective interventions to reduce problematic alcohol use and consequences among college students is essential. My study shows academic goal setting is a promising approach that warrants further exploration within the context of exploratory and experimental prevention research studies. Finally, researchers must endeavor to further explore

how prevention programs can influence alcohol-related cognitions to reduce alcohol use and negative alcohol-related consequences.

TABLES AND FIGURES

Table 1

Attrition by Condition Across Survey Waves

	Academic Condition n (% attrition relative to wave 1)		No Goal/Control Condition n (% attrition relative to wave 1)	
	N	Attrition relative to wave 1	N	Attrition relative to wave 1
Wave 1	175	-	177	-
Wave 2	142	18.9%	141	20.3%
Wave 3	135	22.9%	140	20.9%
Wave 4	138	21.1%	139	21.4%

Table 2

Descriptive Statistics for Model Variables by Condition

	Academic Goals Condition		No Goal/Control Condition	
	M	*SD*	*M*	*SD*
Self-control (W1)	40.57	6.85	40.64	6.41
Goal Commitment (W1)	6.16	0.86	N/A	N/A
Goal Importance (W1)	8.79	1.51	N/A	N/A
Negative Alcohol Expectancies (W1)	45.20	9.82	45.52	9.24
Positive Alcohol Expectancies (W1)	51.17	9.69	51.68	9.09
Negative Alcohol Expectancies (W2)	43.66	8.21198	44.23	9.14
Positive Alcohol Expectancies (W2)	50.66	9.80	50.79	8.67
Negative Alcohol Expectancies (W3)	43.74	8.73	43.73	8.21
Positive Alcohol Expectancies (W3)	49.83	10.23	50.13	8.33
Negative Alcohol Expectancies (W4)	41.70	9.93	43.05	9.28
Positive Alcohol Expectancies (W4)	48.35	11.36	48.69	9.40
Drinking Motives (W1)	10.20	3.28	10.15	3.18
Drinking Motives (W2)	10.07	3.17	10.25	3.03
Drinking Motives (W3)	9.88	3.14	10.30	2.95
Drinking Motives (W4)	9.32	3.12	10.09	2.93
Alcohol Use (W1)	18.51	22.03	14.30	15.00
Alcohol Use (W2)	22.40	24.73	18.33	17.05
Alcohol Use (W3)	23.38	23.53	20.60	18.77
Alcohol Use (W4)	18.70	21.36	17.53	19.69
Negative Alcohol Outcomes (W1)	2.81	4.62	2.65	4.07
Negative Alcohol Outcomes (W2)	2.91	5.05	2.60	3.94
Negative Alcohol Outcomes (W3)	3.28	5.66	3.00	4.75
Negative Alcohol Outcomes (W4)	2.70	5.42	3.04	4.74

Note: W1 = item measured at wave 1, W2 = item measured at wave 2, W3 = item measured at wave 3, W4 = item measured at wave 4.

Table 3

Final Model Coefficients Hypothesis 1

Path	β	*Posterior SD*	*P*	95% CrI
Negative Alcohol Outcomes				
ON Alcohol Expectancies	-0.01	0.02	0.33	[-0.04, 0.04]
ON Condition	-0.69	0.42	0.08	[-1.42, 0.24]
ON Drinking Motives	0.14	0.09	0.03	[-0.00, 0.35]
ON Alcohol Use	0.04	0.01	0.00	[0.02, 0.06]
Drinking Motives				
ON Alcohol Expectancies	0.14	0.02	0.00	[0.11, 0.18]
ON Condition	-0.17	0.38	0.28	[-0.85, 0.56]
Alcohol Use				
ON Alcohol Expectancies	0.40	0.15	0.00	[0.11, .79]
ON Drinking Motives	2.24	0.42	0.00	[1.49, 3.06]
Indirect Effects				
Alcohol Expectancies → Drinking Motives → Negative Alcohol Outcomes	0.02	0.01	0.03	[0.00, .05]
Alcohol Expectancies → Alcohol Use → Negative Alcohol Outcomes	0.02	0.01	0.00	[0.01, 0.03]
Alcohol Expectancies → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes	0.01	0.00	0.00	[0.01, 0.02]
Condition → Drinking Motives → Negative Alcohol Outcomes	-0.02	0.06	0.31	[-0.15, 0.11]
Condition → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes	-0.01	0.04	0.28	[-0.10, 0.06]

Table 4

Final Model Coefficients Hypothesis 2

Path	β	*Posterior SD*	*P*	95% CrI
Negative Alcohol Outcomes				
ON Alcohol Expectancies	-0.01	0.02	.36	[-0.05, 0.03]
ON Condition	-0.54	0.38	.05	[-1.46, 0.07]
ON Drinking Motives	0.16	0.08	.02	[0.00, 0.33]
ON Alcohol Use	0.04	0.01	.00	[0.02, 0.06]
Drinking Motives				
ON Alcohol Expectancies	0.12	0.02	.00	[0.09, 0.16]
ON Condition	1.52	2.10	.24	[-2.01, 6.14]
ON Self-Control	-0.12	0.04	.00	[-0.19, -0.03]
ON Condition*Self-Control	-0.05	0.05	.18	[-0.17, 0.04]
Alcohol Use				
ON Alcohol Expectancies	0.37	0.15	.02	[0.09, 0.16]
ON Drinking Motives	2.27	0.48	.00	[1.41, 3.15]
Indirect Effects				
Alcohol Expectancies → Drinking Motives → Negative Alcohol Outcomes	0.02	0.01	.02	[0.00, 0.04]
Alcohol Expectancies → Alcohol Use → Negative Alcohol Outcomes	0.01	0.01	.02	[0.00, 0.03]
Alcohol Expectancies → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes	0.01	0.00	.00	[0.00, 0.02]
Conditional Indirect Effects				
Self-Control*Condition → Drinking Motives → Negative Alcohol Outcomes	-0.01	0.01	.18	[-0.03, 0.01]
Self-Control*Condition → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes	-0.00	0.01	.18	[-0.02, 0.00]
Additional Parameters				
Condition → Drinking Motives → Negative Alcohol Outcomes @ Low Self-Control	-0.20	0.33	.22	[-1.01, 0.34]
Condition → Drinking Motives → Negative Alcohol Outcomes @ Medium Self-Control	-0.24	0.40	.22	[-1.23, 0.40]
Condition → Drinking Motives → Negative Alcohol Outcomes @ High Self-Control	-0.29	0.46	.22	[-1.44, 0.47]
Condition → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes @ Low Self-Control	-0.10	0.20	.22	[-0.65, 0.13]

Condition → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes @ Medium Self-Control	-0.12	0.24	.21	[-0.79, 0.16]
Condition → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes @ High Self-Control	-0.15	0.28	.22	[-0.93, 0.18]

Table 5

Final Model Coefficients Hypothesis 3

Path	β	*Posterior SD*	*P*	95% CrI
Negative Alcohol Outcomes				
ON Alcohol Expectancies	-0.02	0.04	.35	[-0.10, 0.04]
ON Self-Control	-0.03	0.04	.16	[-0.12, 0.04]
ON Drinking Motives	0.15	0.14	.14	[-0.21, 0.37]
ON Alcohol Use	0.04	0.01	.00	[0.02, 0.07]
Drinking Motives				
ON Alcohol Expectancies	0.12	0.03	.00	[0.04, 0.17]
ON Self-Control	-0.18	0.22	.21	[-0.65, 0.29]
ON Goal Importance	-0.22	1.04	.40	[-2.37, 1.90]
ON Goal Importance*Self-Control	0.00	0.03	.48	[-0.00, 0.05]
Alcohol Use				
ON Alcohol Expectancies	0.32	0.24	.07	[-0.10, 0.73]
ON Drinking Motives	3.3	0.68	.00	[1.94, 4.55]
Indirect Effects				
Alcohol Expectancies → Drinking Motives → Negative Alcohol Outcomes	0.02	0.02	.14	[-0.03, 0.06]
Alcohol Expectancies → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes	0.02	0.01	.00	[0.00, 0.03]
Alcohol Expectancies → Alcohol Use → Negative Alcohol Outcomes	0.01	0.01	.07	[-0.00, 0.04]
Conditional Indirect Effects				
Goal Importance*Self-Control → Drinking Motives → Negative Alcohol Outcomes	0.00	0.01	.46	[-0.02, 0.01]
Goal Importance*Self-Control → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes	0.00	0.00	.48	[-0.01, 0.01]
Additional Parameters				
Self-Control → Drinking Motives → Negative Alcohol Outcomes @ Low Goal Importance	0.01	0.04	.27	[-0.08, 0.11]
Self-Control → Drinking Motives → Negative Alcohol Outcomes @ Medium Goal Importance	0.02	0.05	. 27	[-0.10, 0.12]
Self-Control → Drinking Motives → Negative Alcohol Outcomes @ High Goal Importance	0.02	0.05	.31	[-0.11, 0.13]
Self-Control → Drinking Motives → Alcohol Use → Negative Alcohol	0.02	0.03	.23	[-0.04, 0.10]

Outcomes @ Low Goal Importance				
Self-Control → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes @ Medium Goal Importance	0.02	0.04	.23	[-0.05, 0.11]
Self-Control → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes @ High Goal Importance	0.02	0.04	.27	[-0.06, 0.12]

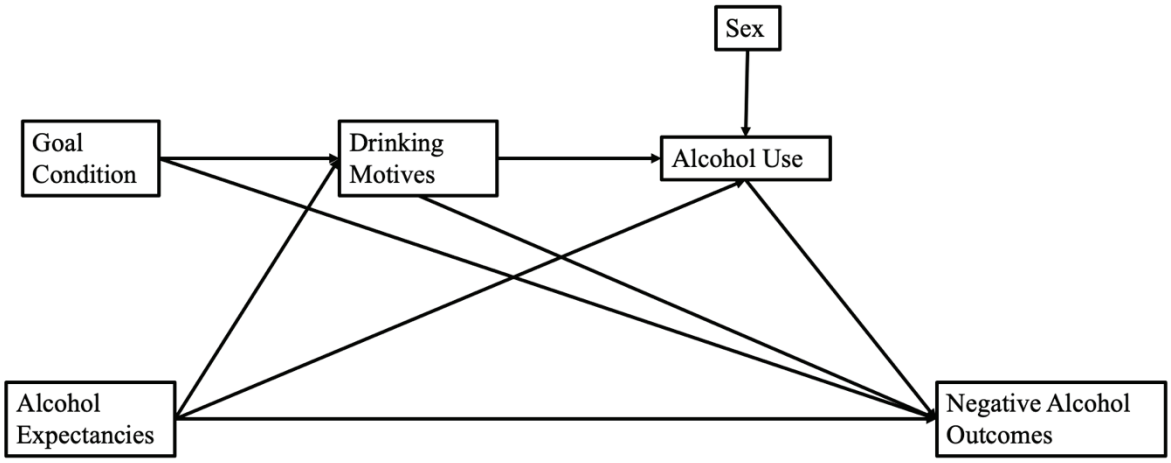

Figure 1. Full Conceptual Model for Hypothesis 1. All direct paths were expected to be significant. Indirect effects were examined via all possible paths from most distal predictors (alcohol expectancies and condition) to negative alcohol outcomes. Hypothesis tested via indirect paths from condition to negative alcohol outcomes.

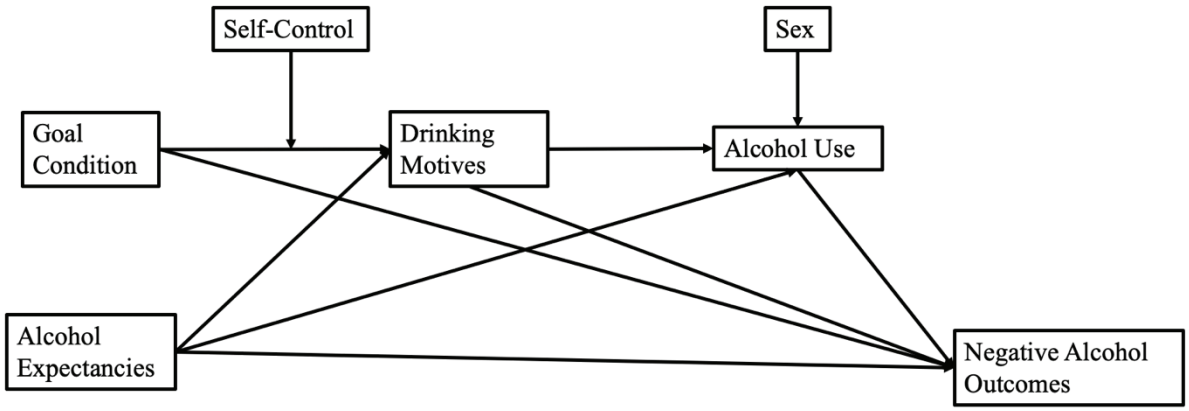

Figure 2. Full Conceptual Model for Hypothesis 2. All direct paths were expected to be significant. Indirect effects were examined via all possible paths from most distal predictors (alcohol expectancies and condition) to negative alcohol outcomes. Hypothesis for moderated mediation (association between goal condition and alcohol-related outcomes is moderated by self-control) was examined via drinking motives alone as well as via drinking motives and alcohol use.

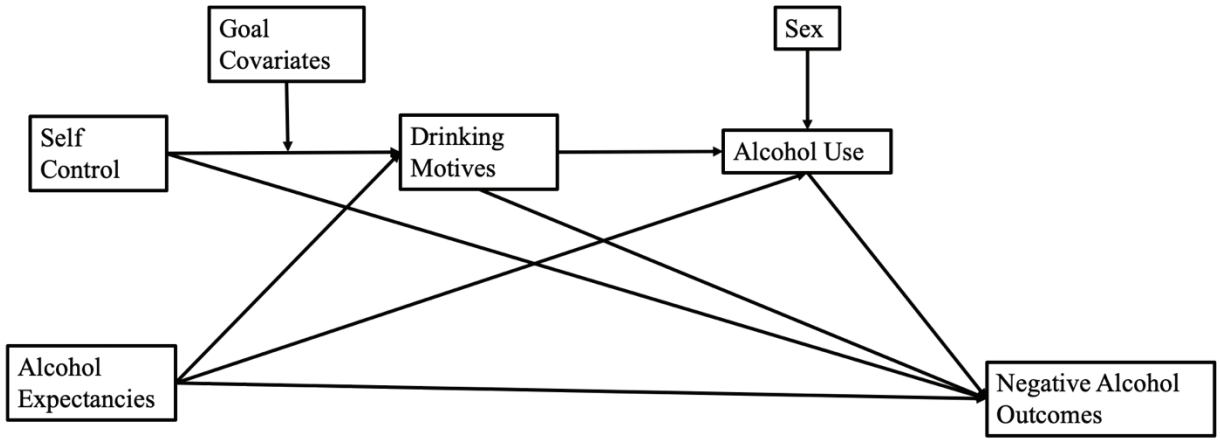

Figure 3. Full Conceptual Model for Hypothesis 3. All direct paths were expected to be significant. Indirect effects were examined via all possible paths from most distal predictors (alcohol expectancies and self-control) to negative alcohol outcomes. Hypothesis for moderated mediation (association between self-control and alcohol-related outcomes is moderated by goal importance) was examined via drinking motives alone as well as via drinking motives and alcohol use.

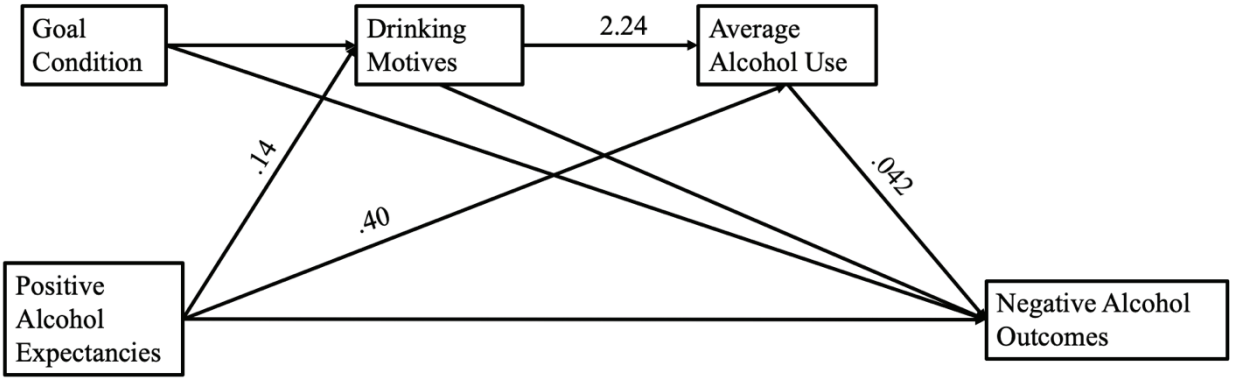

Figure 4. Final Path Model for Hypothesis 1. Coefficients for significant direct paths are portrayed in figure. Paths leading to negative alcohol outcomes are represented as a rate ratio (e.g., a one-unit increase in alcohol use corresponds with a 4.2% increase in negative alcohol outcomes) while other paths are unstandardized coefficients. Significant indirect paths include Alcohol Expectancies → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes β = .01 and Alcohol Expectancies → Alcohol Use → Negative Alcohol Outcomes β = .02.

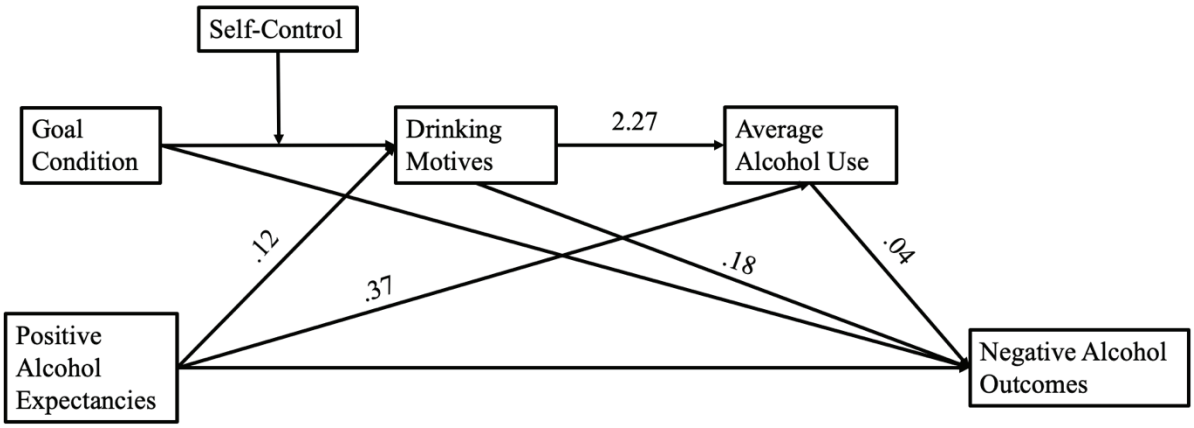

Figure 5. Final Path Model for Hypothesis 2. Coefficients for significant direct paths are portrayed in figure. Paths leading to negative alcohol outcomes are represented as a rate ratio (e.g., a one-unit increase in alcohol use corresponds with a 3.8% increase in negative alcohol outcomes) while other paths are unstandardized coefficients. Significant indirect paths includes: Alcohol Expectancies → Drinking Motives → Negative Alcohol Outcomes β = 0.02, Alcohol Expectancies → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes β = .01, and Alcohol Expectancies → Alcohol Use → Negative Alcohol Outcomes β = .01.

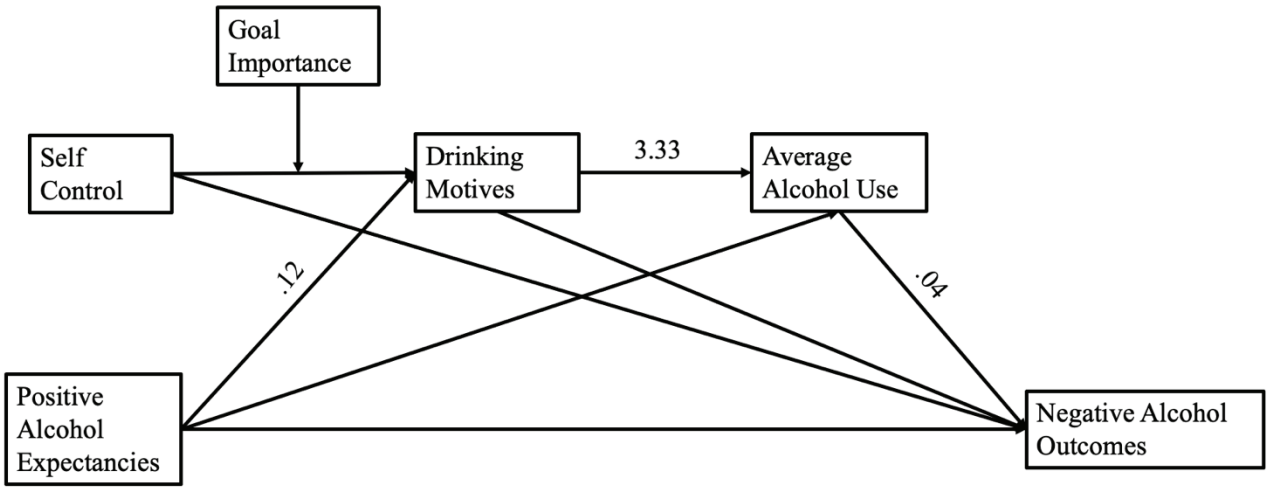

Figure 6.
Final Path Model for Hypothesis 3. Coefficients for significant direct paths are portrayed in figure. Paths leading to negative alcohol outcomes are represented as a rate ratio (e.g., a one-unit increase in alcohol use corresponds with a 4.4% increase in negative alcohol outcomes) while other paths are unstandardized coefficients. The only significant indirect path is Alcohol Expectancies → Drinking Motives → Alcohol Use → Negative Alcohol Outcomes $\beta = 0.02$.

REFERENCES

Arain, M., Haque, M., Johal, L., Mathur, P., Nel, W., Rais, A., Sandhu, R., & Sharma, S. (2013). Maturation of the adolescent brain. *Neuropsychiatric Disease and Treatment*, *9*, 449–461. https://doi.org/10.2147/NDT.S39776

Ashford, S. J., & De Stobbeleir, K. E. (2013). Feedback, goal setting, and task performance revisited. In E. A. Locke, & G. P. Latham (Eds.), *New developments in goal setting and task performance* (pp. 158-176). Routledge.

Baer, J. S., Stacy, A., & Larimer, M. (1991). Biases in the perception of drinking norms among college students. *Journal of Studies on Alcohol*, *52*(6), 580–586. https://doi.org/10.15288/jsa.1991.52.580

Baer, J. S. (1994). Effects of college residence on perceived norms for alcohol consumption: An examination of the first year in college. *Psychology of Addictive Behaviors*, *8*(1), 43-50. Doi:10.1037/0893-164X.8.1.43

Ballou, J. (2011). Open-ended question. In P. J. Lavrakas (Ed.), *Encyclopedia of survey research methods* (pp. 547-549). Sage Publications.

Bandura, A. (1977). *Social learning theory*. Prentice-Hall.

Bandura, A. (1986). *Social foundations of thought and action: a social cognitive theory*. Prentice-Hall, Inc.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. https://doi.org/10.1037//0022-3514.51.6.1173

Barnett, N. P., Clerkin, E. M., Wood, M., Monti, P. M., O'Leary Tevyaw, T., Corriveau, D., Fingeret, A., & Kahler, C. W. (2014). Description and predictors of positive and negative alcohol-related consequences in the first year of college. *Journal of Studies on Alcohol and Drugs*, *75*(1), 103–114. https://doi.org/10.15288/jsad.2014.75.103

Barry, A. E., Jackson, Z., Watkins, D. C., Goodwill, J. R., & Hunte, H. (2017). Alcohol use and mental health conditions among black college males: do those attending postsecondary minority institutions fare better than those at primarily white institutions?. *American Journal of Men's Health*, *11*(4), 962–968. https://doi.org/10.1177/1557988316674840

Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: an overview. *Psychological Inquiry*, *7*(1), 1-15. https://doi.org/10.1207/s15327965pli0701_1

Baumeister, R. F., & Vohs, K. D. (2004). *Handbook of self-regulation: Research, theory, and applications*. Guilford Press.

Baumeister, R. F., & Vohs, K. D. (2007). Self-regulation, ego depletion, and motivation. *Social and Personality Psychology Compass*, 1, 1-14. https://doi.org/10.1111/j.1751-9004.2007.00001.x

Blanco, C., Okuda, M., Wright, C., Hasin, D., Grant, B., Liu, S., & Olfson, M. (2008). Mental health of college students and their non-college attending peers: results from the national epidemiologic study on alcohol and related conditions. *Archives of General Psychiatry, 65*(12), 1429-1437. https://doi.org/10.1001/archpsyc.65.12.1429

Boersma, S. N., Maes, S., Joekes, K., & Dusseldorp, E. (2006). Goal processes in relation to goal attainment: predicting health-related quality of life in myocardial infarction patients. *Journal of Health Psychology*, *11*(6), 927-941. https://doi.org/10.1177/1359105306069095

Bogg, T., Finn, P. R., & Monsey, K. E. (2012). A year in the college life: Evidence for the social investment hypothesis via trait self-control and alcohol consumption. *Journal of Research in Personality*, *46*(6), 694-699. Doi:10.1016/j.jrp.2012.08.004

Borsari, B. (2014). Universal prevention for alcohol use disorders: 1940–2014. *Journal of Studies on Alcohol and Drugs, 17*(Suppl.), 18-25.

Borsari, B., Murphy, J., & Barnett, N. (2007). Predictors of alcohol use during the first year of college: Implications for prevention. *Addictive Behaviors, 32*, 2062-2086. Doi:10.1016/j.addbeh.2007.01.017

Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, *13*(4), 391-424. Doi:10.1016/S0899-3289(01)00098-0

Bouchery, E., Harwood, H., Sacks, J., Simon, C., & Brewer, R. (2011). Economic costs of excessive alcohol consumption in the U.S., 2006. *American Journal of Preventive Medicine. 41*, 516-524.

Brehm, J. W. (1966). *A theory of psychological reactance*. New York: Academic Press.

Brown, S. A. (1985). Expectancies versus background in the prediction of college drinking patterns. *Journal of Consulting and Clinical Psychology, 53*, 123-130. Doi:10.1037/0022-006X.53.1.123

Brown, S., Creamer, V., & Stetson, B. (1987). Adolescent alcohol expectancies in relation to personal and parental drinking patterns. *Journal of Abnormal Psychology, 96,* 117-121. https://doi.org/10.1037//0021-843x.96.2.117

Buote, V., Pancer, M., Pratt, M., Adams, G., Birnie-Lefcovitch, S., Polivy, J., Wintre, M. (2007).

The importance of friends: Friendship and adjustment among 1st-year university students. *Journal of Adolescent Research, 22*(6), 665-689. Doi:10.1177/0743558407306344

Cain, M. K., & Zhang, Z. (2019). Fit for a bayesian: an evaluation of PPP and DIC for structural equation modeling. *Structural Equation Modeling, 26*(1), 39-50. https://doi.org/10.1080/10705511.2018.1490648

Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality-social, clinical and health psychology. *Psychological Bulletin, 92*(2), 111–135. https://doi.org/10.1037/0033-2909.92.1.111

Centers for Disease Control and Prevention (2021). Retrieved from Deaths from Excessive Alcohol Use in the U.S. https://www.cdc.gov/alcohol/features/excessive-alcohol-deaths.html

Chartier, K., & Caetano, R. (2010). Ethnicity and health disparities in alcohol research. *Alcohol research & health : the journal of the National Institute on Alcohol Abuse and Alcoholism, 33*(1-2), 152–160.

Chemers, M. M., Li-tze, H., & Garcia, B. F. (2001). Academic self-efficacy and first-year college student performance and adjustment. *Journal of Educational Psychology*, *93*(1), 55. https://doi.org/10.1037/0022-0663.93.1.55

Christiansen, B. A., Goldman, M. S., & Inn, A. (1982). Development of alcohol-related expectancies in adolescents: Separating pharmacological from social-learning influences. *Journal of Consulting and Clinical Psychology, 50(*3), 336-344. Doi:10.1037/0022-006X.50.3.336

Collins, R. L., & Lapp, W. M. (1992). The temptation and restraint inventory for measuring

drinking restraint. *British Journal of Addiction, 87*, 625 – 633.

Cooper, M. L. (1994). Motivations for alcohol use among adolescents: development and validation of a four-factor model. *Psychological Assessment, 6*(2), 117-128. https://doi.org/10.1037/1040-3590.6.2.117

Cooper, M.L., Russell, M., Skinner, J.B., & Windle, M. (1992). Development and validation of a three-dimensional measure of drinking motives. *Psychological Assessment, 4*(2), 123-132. https://doi.org/10.1037/1040-3590.4.2.123

Conti, R. (2000). College goals: Do self-determined and carefully considered goals predict intrinsic motivation, academic performance, and adjustment during the first semester?. *Social Psychology of Education, 4(*2), 189-211. Doi:10.1023/A:1009607907509

Correia, C. J., Benson, T. A., & Carey, K. B. (2005). Decreased substance use following increases in alternative behaviors: A preliminary investigation. *Addictive Behaviors, 30*(1), 19-27. Doi:10.1016/j.addbeh.2004.04.006

Cox, W. M., & Klinger, E. (1988). A Motivational Model of Alcohol Use. *Journal of Abnormal Psychology, 97*, 168-180. https://doi.org/10.1037//0021-843x.97.2.168

Cox, W., & Klinger, E. (2011). A Motivational Model of Alcohol Use: Determinants of use and change. In W. Cox, E. Klinger (Eds.), *Handbook of motivational counseling: Goal-based approaches to assessment and intervention with addiction and other problems* (2nd ed., pp. 131-158). Wiley-Blackwell. Doi:10.1002/9780470979952.ch6

Cox, W. M., Schippers, G. M., Klinger, E., Skutle, A., Stuchlíková, I., Man, F., King, A. L., & Inderhaug, R. (2002). Motivational structure and alcohol use of university students with consistency across four nations. *Journal of Studies on Alcohol, 63*, 280–285. https://doi.org/10.15288/jsa.2002.63.280

Curtin, L., Stephens, R. S., & Bonenberger, J. L. (2001). Goal setting and feedback in the reduction of heavy drinking in female college students. *Journal of College Student Psychotherapy, 15*(3), 17-37. https://psycnet.apa.org/doi/10.1300/J035v15n03_03

Day, D. V., Unsworth, K. L. (2013). Goals and self-regulation: Emerging perspectives across levels and time in new developments. In E. A. Locke & G. P. Latham (Eds.), *New developments in goal setting and task performance*, (pp. 158-176). Routledge/Taylor & Francis Group.

DeHart, T., Peterson, J. L., Richeson, J. A., Hamilton, H. R. (2014). A diary of daily perceived Mistreatment and alcohol consumption in college students. *Basic and Applied Social Psychology, 36,* 443-451.

D'Lima, G., Pearson, M. R., & Kelley, M. L. (2012). Protective behavioral strategies as a mediator and moderator of the relationship between self-regulation and alcohol-related consequences in first-year college students. *Psychology of Addictive Behaviors*, *26*(2), 330-337. doi:10.1037/a0026942

Elliot, A. J., & Devine, P. G. (1994). On the motivational nature of cognitive dissonance: dissonance as psychological discomfort. *Journal of Personality and Social Psychology, 67*, 382-394.

Fairchild, A. J., & McDaniel, H. L. (2017). Best (but oft-forgotten) practices: mediation analysis. *The American Journal of Clinical Nutrition*, *105*(6), 1259–1271. https://doi.org/10.3945/ajcn.117.152546

Festinger, L. (1957). *A theory of cognitive dissonance.* Stanford University Press.

Fromme, K., Stroot, E. A., & Kaplan, D. (1993). Comprehensive effects of alcohol:

Development and psychometric assessment of a new expectancy questionnaire. *Psychological Assessment, 5*(1), 19-26. Doi:10.1037/1040-3590.5.1.19

Gardner, S. K., Robertson, A. A., Tatch, A., & Walker, C. S. (2020). Racial differences in college-student drinking, *Journal of Ethnicity in Substance Abuse, 19*(1), 28-43. https://doi.org/10.1080/15332640.2018.1446376

Gavin, L., MacKay, A. P., Brown, K., Harrier, S., Ventura, S. J., Kann, L., Rangel, M., Berman, S., Dittus, P., Liddon, N., Markowitz, L., Sternberg, M., Weinstock, H., David-Ferdon, C., Ryan, G., & Centers for Disease Control and Prevention (CDC) (2009). Sexual and reproductive health of persons aged 10-24 years - United States, 2002-2007. *Morbidity and mortality weekly report. Surveillance summaries (Washington, D.C. : 2002)*, *58*(6), 1–58.

Gelfand, L. A., Mensinger, J. L., & Tenhave, T. (2009). Mediation analysis: a retrospective snapshot of practice and more recent directions. *The Journal of General Psychology*, *136*(2), 153–176. https://doi.org/10.3200/GENP.136.2.153-178

Gibson, C., Schreck, C. J., & Miller, J. (2004). Binge drinking and negative alcohol-related behaviors: A test of self-control theory. *Journal of Criminal Justice*, *32*(5), 411-420. Doi:10.1016/j.jcrimjus.2004.06.003

Giedd, J. N., & Rapoport, J. L. (2010). Structural MRI of pediatric brain development: what have we learned and where are we going?. *Neuron*, *67*(5), 728–734. https://doi.org/10.1016/j.neuron.2010.08.040

Goldman, M., Brown, S., & Christiansen, B. (1987). Expectancy theory: Thinking about drinking. In H. T. Blane & K. E. Leonard (Eds.), *Psychological theories of drinking and alcoholism* (pp. 181-226). Guilford Press.

Gollwitzer, P. M. (1990). Action phases and mind-sets. In E. T. Higgins, & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition,* Vol. 2 (pp. 53–92). Guilford Press.

Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and processes. In M. P. Zanna (Ed.) , *Advances in experimental social psychology, Vol 38* (pp. 69-119). San Diego, CA US: Elsevier Academic Press.

Greene, K. M., & Maggs, J. L. (2020). Drinking, social abstaining, and refusing invitations: Demographic differences persist across college. *Alcoholism, Clinical and Experimental Research, 44*(1), 203-211. https://doi.org/10.1111/acer.14231

Grekin E. R. (2012). Perceived racism and alcohol consequences among African American and Caucasian college students. *Psychology of Addictive Behaviors, 26*(4), 924–930. https://doi.org/10.1037/a0029593

Grieve, R., Witteveen, K., Tolan, G., & Jacobson, B. (2014). Development and validation of a measure of cognitive and behavioural social self-efficacy. *Personality & Individual Differences*, *59,* 71-76. Doi:10.1016/j.paid.2013.11.008

Griffin, K. (2009). The epidemiology of substance use among adolescents and young adults: A developmental perspective. In L. M. Scheier (Ed.), *Handbook of drug use etiology: Theory, methods, and empirical findings* (pp. 73-92). American Psychological Association.

Ham, L. S., Bonin, M., & Hope, D. A. (2007). The role of drinking motives in social anxiety and alcohol use. *Journal of Anxiety Disorders, 21,* 991-1003. https://doi.org/10.1016/j.janxdis.2006.10.014

Ham, L. S., Zamboanga, B. L., Bacon, A. K., & Garcia, T. A. (2009). Drinking motives as mediators of social anxiety and hazardous drinking among college students. *Cognitive Behaviour Therapy, 38*(3), 133-145. https://doi.org/10.1080/16506070802610889

Hanna, K. M., Scott, L. L., & Schmidt, K. K. (2014). Retention strategies in longitudinal studies with emerging adults. *Clinical Nurse Specialist CNS*, *28*(1), 41–45. https://doi.org/10.1097/NUR.0000000000000020

Hariton, E., & Locascio, J. J. (2018). Randomised controlled trials – the gold standard for effectiveness research: Study design: Randomised controlled trials. *BJOG : An International Journal of Obstetrics and Gynaecology*, *125*(13), 1716. https://doi.org/10.1111/1471-0528.15199

Hingson, R. W., Zha, W., & Weitzman, E. R. (2009). Magnitude of and trends in alcohol-related mortality and morbidity among U.S. college students ages 18-24, 1998-2005. *Journal of Studies on Alcohol and Drugs. Supplement*, (16), 12–20. https://doi.org/10.15288/jsads.2009.s16.12

Hoeppner, B. B., Barnett, N. E., Jackson, K. M., Colby, S. M., Kahler, C. W., Monti, P. M., Read, J., Tevyaw, T., Wood, M., Corriveau, D., & Fingeret, A. (2012). Daily college student drinking patterns across the first year of college. *Journal of Studies on Alcohol & Drugs*, *73*(4), 613–624. https://doi.org/10.15288/jsad.2012.73.613

Hoeppner, B. B., Stout, R. L., Jackson, K. M., & Barnett, N. P. (2010). How good is fine-grained Timeline Follow-back data? Comparing 30-day TLFB and repeated 7-day TLFB alcohol consumption reports on the person and daily level. *Addictive Behaviors, 35*(12), 1138-1143. https://doi.org/10.1016/j.addbeh.2010.08.013

Hollenbeck, J. R., Williams, C. R., & Klein, H. J. (1989). An empirical examination of the

antecedents of commitment to difficult goals. *Journal of Applied Psychology*, *74*(1), 18-23. Doi:10.1037/0021-9010.74.1.18

Hussong, A. M. (2003). Social influences in motivated drinking among college students. *Psychology of Addictive Behaviors, 17*(2)*,* 142-150. https://doi.org/10.1037/0893-164x.17.2.142

Hustad, J. P., Carey, K. B., Carey, M. P., & Maisto, S. A. (2009). Self-regulation, alcohol consumption, and consequences in college student heavy drinkers: A simultaneous latent growth analysis. *Journal of Studies on Alcohol & Drugs*, *70*(3), 373-382. Doi: 10.15288/jsad.2009.70.373

Iwamoto, D. K., Kaya, A., Grivel, M., & Clinton, L. (2016). Under-researched demographics: heavy episodic drinking and alcohol-related problems among asian americans. *Alcohol Research: Current Reviews*, *38*(1), 17–25.

Jones, B. T., Corbin, W., & Fromme, K. (2001). A review of expectancy theory and alcohol consumption. *Addiction, 96*(1), 57-72. Doi:10.1046/j.1360-0443.2001.961575.x

Kelloway, K. (2015). Structural equation models. In *Using mplus for structural equation modeling* (pp. 5-20). SAGE Publications, Inc. https://www.doi.org/10.4135/9781483381664

Kilmer, J. R., Cronce, J. M., & Larimer, M. E. (2014). College Student Drinking Research From the 1940s to the Future: Where We Have Been and Where We Are Going. *Journal of Studies on Alcohol and Drugs, 17*(Suppl.), 18-25.

Klein, H. J., Wesson, M. J., Hollenbeck, J. R., Wright, P. M., & DeShon, R. P. (2001). The assessment of goal commitment: A measurement model meta-analysis. *Organizational Behavior and Human Decision Processes*, *85*(1), 32-55.

https://doi.org/10.1006/obhd.2000.2931

Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2005). Why do young people drink? *Clinical Psychology Review, 25*(7), 841-861. https://doi.org/10.1016/j.cpr.2005.06.002

Kuntsche, E., Stewart, S., & Cooper, L. (2008). How stable is the motive–alcohol use link? A cross-national validation of the drinking motives questionnaire revised among adolescents from Switzerland, Canada, and the United States. *Journal of Studies on Alcohol and Drugs, 69*(3), 388-396. https://doi.org/10.15288/jsad.2008.69.388

Kuntsche, E., Wiers, R. W., Janssen, T., & Gmel, G. (2010). Same wording, distinct concepts? Testing differences between expectancies and motives in a mediation model of alcohol outcomes. *Experimental and Clinical Psychopharmacology, 18*(5), 436-444. https://doi.org/10.1037/a0019724

Kuther, T.L., & Timoshin, A. (2003). A comparison of social cognitive and psychosocial predictors of alcohol use by college students. *Journal of College Student Development 44*(2), 143-154. doi:10.1353/csd.2003.0018.

Larimer, M. E., Neighbors, C., LaBrie, J. W., Atkins, D. C., Lewis, M. A., Lee, C. M., Kilmer, J. R., Kaysen, D. L., Pedersen, E. R., Montoya, H., Hodge, K., Desai, S., Hummer, J. F., & Walter, T. (2011). Descriptive drinking norms: For whom does reference group matter?. *Journal of Studies on Alcohol and Drugs, 72*(5), 833-843. https://doi.org/10.15288/jsad.2011.72.833

Lauver, D., Worawong, C., & Olsen, C. (2008). Health goals among primary care patients. *Journal of the American Academy of Nurse Practitioners*, *20*(3), 144-154. https://doi.org/10.1111/j.1745-7599.2007.00296.x

Lecci, L., MacLean, M. G., & Croteau, N. (2002). Personal goals as predictors of college

student drinking motives, alcohol use and related problems. *Journal of Studies On Alcohol*, 63(5), 620. https://doi.org/10.15288/jsa.2002.63.620

Leeman, R. F., & Wapner, S. (2001). Some factors involved in alcohol consumption of first-year undergraduates. *Journal of Drug Education*, *31*(3), 249-262. https://doi.org/10.2190/T3HB-7J57-KG3T-3BL0

Lewis, M., Hove, C., Whiteside, U., Lee, C., Kirkeby, B., Oster-Aaland, L., Neighbors, C., Larimer, M. (2008). Fitting in and feeling fine: Conformity and coping motives as mediators of the relationship between social anxiety and problematic drinking. *Psychology of Addictive Behaviors, 22*(1)*,* 58-67. https://doi.org/10.1037/0893-164X.22.1.58

Little, B. R. (1983). Personal projects: A rationale and method for investigation. *Environment and Behavior, 15*(3), 273-309. https://doi.org/10.1177/0013916583153002

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance*. Prentice Hall.

Locke, E. A. & Latham, G. P. (2013). Goal Setting Theory, 1990. In E. A. Locke & G. P. Latham (Eds.), *New Developments in Goal Setting and Task Performance,* (pp. 3-15). Routledge/Taylor & Francis Group.

Lozano, B. E., & Stephens, R. S. (2010). Comparison of participatively set and assigned goals in the reduction of alcohol use. *Psychology of Addictive Behaviors, 24*(4), 581-591. Doi:10.1037/a0021444

Lyvers, M., Hasking, P., Hani, R., Rhodes, M., Trew, E. (2010). Drinking motives, drinking restraint and drinking behaviour among young adults. *Addictive Behaviors, 35*(2), 116-122. https://doi.org/10.1016/j.addbeh.2009.09.011

MacKenzie, M. B., Mezo, P. G., & Francis, S. E. (2012). A conceptual framework for understanding self-regulation in adults. *New Ideas in Psychology*,*30*(2), 155-165. https://doi.org/10.1037/a0021444

MacKinnon D. P. (2000). Contrasts in multiple mediator models. In J. S. Rose, L. Chassin, C. C. Presson, & S. J. Sherman (Eds.), *Multivariate applications in substance use research: New methods for new questions* (pp. 141–60). Lawrence Erlbaum Associates Publishers.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology*, *58*, 593–614. https://doi.org/10.1146/annurev.psych.58.110405.085542

Maggs, J. L., (1997). Alcohol use and binge drinking as goal-directed action during the transition to post-secondary education. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 345-371). Cambridge University Press.

Maggs, J. L., & Schulenberg, J. E. (2004). Trajectories of Alcohol Use During the Transition to Adulthood. *Alcohol Research & Health*, *28*(4), 195–201.

Martens, M. P., Ferrier, A. G., Sheehy, M. J., Corbett, K., Anderson, D. A., & Simmons, A. (2005). Development of the protective behavioral strategies survey. *Journal of studies on alcohol, 66*(5), 698–705. https://doi.org/10.15288/jsa.2005.66.698

Mastroleo, N. R., Barnett, N. P., & Bowers, K. M. (2019). Association between sex, race/ethnicity, season, day of week, and alcohol use and related risks in college student athletes and nonathletes. *Journal of American College Health, 67*(5), 422–432. https://doi.org/10.1080/07448481.2018.1484367

Meque, I., Salom, C., Betts, K. S., & Alati, R. (2019). Predictors of Alcohol Use Disorders

Among Young Adults: A Systematic Review of Longitudinal Studies. *Alcohol and Alcoholism, 54*(3), 310-324. https://doi.org/10.1093/alcalc/agz020

Merrill, J. E., & Carey, K. B. (2016). Drinking over the lifespan: Focus on college ages. *Alcohol Research: Current Reviews*, *38*(1), 103–114.

Merrill, J. E., Kenney, S. R., & Barnett, N. P. (2017). A time-varying effect model of the dynamic association between alcohol use and consequences over the first two years of college. *Addictive Behaviors*, *73*, 57–62. https://doi.org/10.1016/j.addbeh.2017.04.022

Merrill, J. E., Treloar, H., Fernandez, A. C., Monnig, M. A., Jackson, K. M., & Barnett, N. P. (2016). Latent growth classes of alcohol-related blackouts over the first 2 years of college. *Psychology of Addictive Behaviors*, *30*(8), 827–837. https://doi.org/10.1037/adb0000214

Merrill, J. E., Wardell, J. D., & Read, J. P. (2014). Drinking motives in the prospective prediction of unique alcohol-related consequences in college students. *Journal of Studies on Alcohol and Drugs*, *75*(1), 93–102. https://doi.org/10.15288/jsad.2014.75.93

Miller, P. M., Smith, G. T., & Goldman, M. S. (1990). Emergence of alcohol expectancies in childhood: A possible critical period. *Journal of Studies on Alcohol, 51*(4), 343-349. https://doi.org/10.15288/jsa.1990.51.343

Murphy, J. G., Dennhardt, A. A., Skidmore, J. R., Borsari, B., Barnett, N. P., Colby, S. M., & Martens, M. P. (2012). A randomized controlled trial of a behavioral economic supplement to brief motivational interventions for college drinking. *Journal of Consulting and Clinical Psychology, 80*(5), 876-886. https://doi.org/10.1037/a0028763

Muthén, B., & Asparouhov, T. (2012). Bayesian structural equation modeling: A more flexible

representation of substantive theory. *Psychological Methods*, *17*(3), 313–335. https://doi.org/10.1037/a0026802

Muthén, L.K., & Muthén, B.O. (1998-2017). *Mplus User's Guide*. (8th ed). Muthén & Muthén

Muthén, L.K., Muthén, B.O., & Asparouhov, T. (2011). Mplus Short Courses Topic 9 Bayesian Analysis Using Mplus [PowerPoint slides]. www.statmodel.com https://www.statmodel.com/download/Topic9-v52%20[Compatibility%20Mode].pdf

National Institute on Alcohol Abuse and Alcoholism (2002). A call to action: Changing the culture of drinking at U.S. colleges. Retrieved from http://www.collegedrinkingprevention.gov/media/taskforcereport.pdf

National Institute on Alcohol Abuse and Alcoholism (2003). Assessing alcohol problems a guide for clinicians and researchers second edition. (NIH publication No. 03-3745). Retrieved from http://pubs.niaaa.nih.gov/publications/AssessingAlcohol/

National Institute on Alcohol Abuse and Alcoholism (2012). College drinking. Retrieved from http://pubs.niaaa.nih.gov/publications/CollegeFactSheet/CollegeFactSheet.pdf

Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Larimer, M. E. (2007). Are social norms the best predictor of outcomes among heavy-drinking college students?. *Journal of Studies on Alcohol and Drugs*, *68*(4), 556-565. https://doi.org/10.15288/jsad.2007.68.556

Nock M. K. (2007). Conceptual and design essentials for evaluating mechanisms of change. *Alcoholism, Clinical and Experimental Research*, *31*(10 Suppl), 4s–12s. https://doi.org/10.1111/j.1530-0277.2007.00488.x

O'Connor R., & Colder C. R. (2005). Predicting alcohol patterns in first-year college students through motivational systems and reasons for drinking. *Psychology of Addictive Behaviors, 19*(1), 10-20. https://doi.org/10.1037/0893-164X.19.1.10

O'Malley, P. M. (2004). Maturing out of problematic alcohol use. *Alcohol Research & Health, 28*(4), 202-204.

O'Malley, P. M., & Johnston, L. D. (2002). Epidemiology of alcohol and other drug use among American college students. *Journal of studies on alcohol. Supplement,* (14), 23–39. https://doi.org/10.15288/jsas.2002.s14.23

Palfai, T. P. (2006). College student alcohol use in context: The utility of goal constructs. *Psychology of Addictive Behaviors, 20*(2), 143-144. Doi:10.1037/0893-164X.20.2.143

Palfai, T. P., & Ralston, T. E. (2011). Life goals and alcohol use among first-year college students: The role of motives to limit drinking. *Addictive Behaviors, 36*(11), 1083-1086. Doi:10.1016/j.addbeh.2011.06.005

Palfai, T. P., Ralston, T. E., & Wright, L. L. (2011). Understanding university student drinking in the context of life goal pursuits: The mediational role of enhancement motives. *Personality & Individual Differences, 50*(2), 169-174. Doi:10.1016/j.paid.2010.09.020

Palfai, T. P., & Weafer, J. (2006). College student drinking and meaning in the pursuit of life goals. *Psychology of Addictive Behaviors, 20*(2), 131-134. Doi:10.1037/0893-164X.20.2.131

Park, C. (2004). Positive and negative consequences of alcohol consumption in college students. *Addictive Behaviors, 29*(2), 311-321. https://doi.org/10.1016/j.addbeh.2003.08.006

Park, C., & Grant, C. (2005) Determinants of positive and negative consequences of alcohol consumption in college students: alcohol use, gender, and psychological characteristics. *Addictive Behaviors, 30,* 755-765. https://doi.org/10.1016/j.addbeh.2004.08.021

Pearson, M. R., Kite, B. A., & Henson, J. M. (2013). Predictive effects of good self-control and poor regulation on alcohol-related outcomes: Do protective behavioral strategies mediate?. *Psychology of Addictive Behaviors*, *27*(1), 81-89. Doi:10.1037/a0028818

Pennington, C. R., Qureshi, A., Monk, R. L., & Heim, D. (2016). The effects of stereotype threat and contextual cues on alcohol users' inhibitory control. *Addictive Behaviors, 54*, 12-17. https://doi.org/10.1016/j.addbeh.2015.11.014

Perkins, H.W., & Berkowitz, A.D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions, 21*(9-10), 961-976. https://doi.org/10.3109/10826088609077249

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717–731. https://doi.org/10.3758/bf03206553

Presseau, J., Sniehotta, F. F., Francis, J. J., & Little, B. R. (2008). Personal projects analysis: Opportunities and implications for multiple goal assessment, theoretical integration, and behaviour change. *The European Health Psychologist, 10,* 32-36.

Quinn, P. D., & Fromme, K. (2010). Self-regulation as a protective factor against risky drinking and sexual behavior. *Psychology of Addictive Behaviors*, *24*(3), 376-385. doi:10.1037/a0018547

Reja, U., Manfreda, K. L., Hlebec, V., & Vehovar. (2003). Open-ended vs. close-ended questions in web questionnaires. *Developments in Applied Statistics, 19,* 159-177.

Reynolds, E. K., MacPherson, L., Tull, M. T., Baruch, D. E., & Lejuez, C. W. (2011).

Integration of the brief behavioral activation treatment for depression (BATD) into a college orientation program: Depression and alcohol outcomes. *Journal of Counseling Psychology, 58*(4), 555-564. doi:10.1037/a0024634

Rhoades, B. L., & Maggs, J. L. (2006). Do academic and social goals predict planned alcohol use among college-bound high school graduates?. *Journal of Youth and Adolescence, 35*(6), 913-923. doi:10.1007/s10964-006-9040-y

Ricciardelli, L. A., Williams, R. J., & Finemore, J. (2001). Restraint as misregulation in drinking and eating. *Addictive Behaviors*, *26*(5), 665-675. doi:10.1016/S0306-4603(00)00149-0

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68. https://psycnet.apa.org/doi/10.1037/0003-066X.55.1.68

Sacks, J. J., Gonzales, K. R., Bouchery, E. E., Tomedi, L. E., & Brewer, R. D. (2015). 2010 national and state costs of excessive alcohol consumption. *American Journal of Preventive Medicine*, *49*(5), e73–e79. https://doi.org/10.1016/j.amepre.2015.05.031

Schulenberg, J. E., Johnston, L. D., O'Malley, P. M., Bachman, J. G., Miech, R. A., & Patrick, M. E. (2018). Monitoring the future national survey results on drug use, 1975-2017. Volume II, college students & adults ages 19-55. *Institute for Social Research*.

Schulenberg, J., O'Malley, P. M., Bachman, J. G., Wadsworth, K. N., & Johnston, L. D. (1996). Getting drunk and growing up: Trajectories of frequent binge drinking during the transition to young adulthood. *Journal of Studies on Alcohol, 57*(3), 289-304. Retrieved from https://files.eric.ed.gov/fulltext/ED589764.pdf

Scott-Sheldon, L. A. J., Carey, K. B., Elliott, J. C., Garey, L., & Carey, M. P. (2014). Efficacy of

alcohol interventions for first-year college students: A meta-analytic review of randomized controlled trials. *Journal of Consulting and Clinical Psychology*, *82*(2), 177–188. https://doi.org/10.1037/a0035192

Simons, J. S., Christopher, M. S., Oliver, M. I., & Stanage, E. J. (2006). A content analysis of personal strivings: Associations with substance use. *Addictive Behaviors, 31*(7), 1224-1230. doi:10.1016/j.addbeh.2005.09.012

Singleton, R. (2007). Collegiate alcohol consumption and academic performance. *Journal of Studies on Alcohol and Drugs, 68*(4), 548-555. https://doi.org/10.15288/jsad.2007.68.548

Smith, G., Goldman, M., Greenbaum, P., & Christiansen, B. (1995). Expectancy for social facilitation from drinking: The divergent paths of high-expectancy and low-expectancy adolescents. *Journal of Abnormal Psychology, 104*(1), 32–40. https://doi.org/10.1037//0021-843x.104.1.32

Sobel, M. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology,13*, 290-312. doi:10.2307/270723

Sobell, L. C., Brown, J., Leo, G. I., & Sobell, M. B. (1996). The reliability of the Alcohol Timeline Followback when administered by telephone and by computer. *Drug and Alcohol Dependence, 42*(1), 49-54. doi:10.1016/0376-8716(96)01263-XSobell, L.C., &

Sobell, M.B. (2000). Alcohol Timeline Followback (TFLB). In American Psychiatric Association (Ed.), *Handbook of Psychiatric Measures* (pp. 477-479). American Psychiatric Association.

Sobell, L. C., & Sobell, M. B. (2003) Alcohol consumption measures. In J. P. Allen & V. B. Wilson (Eds.) *Assessing alcohol problems: A guide for clinicians and researchers*

(NIH Publication No. 03–3745). Retrieved from http://pubs.niaaa.nih.gov/publications/AssessingAlcohol/measures.htm

Stacy, A. W., Widaman, K. F., & Marlatt, G. (1990). Expectancy models of alcohol use. *Journal of Personality and Social Psychology, 58*(5), 918-928. doi:10.1037/0022- 3514.58.5.918

Stahre, M., Roeber, J., Kanny, D., Brewer, R. D., & Zhang, X. (2014). Contribution of excessive alcohol consumption to deaths and years of potential life lost in the United States. *Preventing Chronic Disease*, *11*, E109. https://doi.org/10.5888/pcd11.130293

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist, 52*(6), 613–629. https://doi.org/10.1037/0003-066X.52.6.613

Sweeney, J. C., Hausknecht, D., & Soutar, G. N. (2000). Cognitive dissonance after purchase: A mutidimensional scale. *Psychology & Marketing*, *17*(5), 369–385. https://doi-org.ezproxy2.library.colostate.edu/10.1002/(SICI)1520-6793(200005)17:5<369::AID-MAR1>3.0.CO;2-G

Tangney, J. P., Baumeister, R. F., & Boone, A. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, *72*(2), 271-324. doi:10.1111/j.0022-3506.2004.00263.x

Taylor, S. D., Bagozzi, R. P., Gaither, C. A., & Jamerson, K. A. (2006). The bases of goal setting in the self-regulation of hypertension. *Journal of Health Psychology*, *11*(1), 141-162. doi:10.1177/1359105306058869

Teague, S., Youssef, G. J., Macdonald, J. A., Sciberras, E., Shatte, A., Fuller-Tyszkiewicz, M., Greenwood, C., McIntosh, J., Olsson, C. A., Hutchinson, D., & SEED Lifecourse Sciences Theme (2018). Retention strategies in longitudinal cohort studies: a systematic

review and meta-analysis. *BMC Medical Research Methodology*, *18*(1), 151. https://doi.org/10.1186/s12874-018-0586-7

Thorpe, S., Tanner, A. E., Ware, S., Guastaferro, K., Milroy, J. J., & Wyrick, D. L. (2020). Black first-year college students' alcohol outcome expectancies. *American Journal of Health Education*, *51*(2), 78–86. https://doi.org/10.1080/19325037.2020.1713259

Tibbetts, S. G., & Whittimore, J. N. (2002). The interactive effects of low self-control and commitment to school on substance abuse among college students. *Psychological Reports*, *90*(1), 327-337. doi:10.2466/PR0.90.1.327-337

Tofighi, D., & MacKinnon, D. P. (2011). RMediation: An R package for mediation analysis confidence intervals. *Behavior Research Methods*, *43*(3), 692–700. https://doi.org/10.3758/s13428-011-0076-x

Tofighi, D., & Kelley, K. (2020). Indirect effects in sequential mediation models: Evaluating methods for hypothesis testing and confidence interval formation. *Multivariate Behavioral Research*, *55*(2), 188–210. https://doi.org/10.1080/00273171.2019.1618545

Turner, J. C., & Shu, J. (2004). Serious health consequences associated with alcohol use among college students: demographic and clinical characteristics of patients seen in an emergency department. *Journal of Studies on Alcohol*, *65*(2), 179–183. https://doi.org/10.15288/jsa.2004.65.179

Upcraft, L. (2002). Today's first-year students and alcohol. *College Drinking Prevention.* Retrieved from: http://www.collegedrinkingprevention.gov/SupportingResearch/upcraft1.aspx

U.S. Department of Health and Human Services. (2007). The Surgeon General's call to action to

prevent and reduce underage drinking. Rockville, MD: office of the Surgeon General. Retrieved from http://www.ncbi.nlm.nih.gov/books/NBK44360/

van Damme, J. J., Maes, L. L., Clays, E. E., Rosiers, J. T., van Hal, G. G., & Hublet, A. A. (2013). Social motives for drinking in students should not be neglected in efforts to decrease problematic drinking. *Health Education Research*, *28*(4), 640-650. doi:10.1093/her/cyt036

van de Schoot, R., Kaplan, D., Denissen, J., Asendorpf, J. B., Neyer, F. J., & van Aken, M. (2014). A gentle introduction to bayesian analysis: Applications to developmental research. *Child Development*, *85*(3), 842–860. https://doi.org/10.1111/cdev.12169

Vaughan, E., Corbin, W., & Fromme, K. (2009). Academic and social motives and drinking behavior. *Psychology of Addictive Behaviors*, 23(4), 564-576.

Vicary, J., & Karshin, C. (2002). College alcohol abuse: A review of the problems, issues, and prevention approaches. *Journal of Primary Prevention, 22*(3), 299-331. https://psycnet.apa.org/doi/10.1023/A:1013621821924

Voss, A. T., Jorgensen, M. K., & Murphy, J. G. (2021). Episodic future thinking as a brief alcohol intervention for heavy drinking college students: A pilot feasibility study. *Experimental and Clinical Psychopharmacology*. https://doi.org/10.1037/pha0000451

Werch, C. E., & Gorman, D. R. (1986). Factor analysis of internal and external self-control practices for alcohol consumption. *Psychological Reports, 59*, 1207–1213. http://dx.doi.org/10.2466/pr0.1986.59.3.1207

Werch, C. E., & Gorman, D. R. (1988). Relationship between self-control and alcohol consumption patterns and problems of college students. *Journal of Studies on Alcohol*, *49*(1), 30-37. https://doi.org/10.15288/jsa.1988.49.30

White, H., Fleming, C., Kim, M., Catalano, R., & McMorris, B. (2008). identifying two potential mechanisms for changes in alcohol use among college-attending and non-college-attending emerging adults. *Developmental Psychology, 44*(6), 1625-1639. https://dx.doi.org/10.1037%2Fa0013855

White, A., & Hingson, R. (2013). The burden of alcohol use: excessive alcohol consumption and related consequences among college students. *Alcohol Research: Current Reviews*, *35*(2), 201–218.

White, H. R., & Labouvie, E. W. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol, 50*(1), 30-37 doi: 10.15288/jsa.1989.50.30. PMID: 2927120.

Williams, R. J., & Ricciardelli, L. A. (1999). Restrained drinking and cognitive control among adolescents. *Adolescence*, *34*(135), 557-565.

Wood, M. D., Read, J. P., Palfai, T. P., & Stevenson, J. F. (2001). Social influence processes and college student drinking: The mediational role of alcohol outcome expectations. *Journal of Studies on Alcohol, 62*(1), 32-43. https://doi.org/10.15288/jsa.2001.62.32

Wood, M., Sher, K., & McGowan, A. (2000). Collegiate alcohol involvement and role attainment in early adulthood: Findings from a prospective high-risk study. *Journal of Studies on Alcohol, 61*(2), 278-89. https://doi.org/10.15288/jsa.2000.61.278

APPENDICES

Appendix I

Measure of goal importance

Note: Goal importance questions were asked for each goal, individually, and each goal was automatically fed into this part of the survey.

Instructions: Please consider your goal, "X" and respond to the following questions

1. How important is achieving this academic goal to you?

1 (Not at all important) to 10 (Very important)

2. Please describe why this academic goal is important to you (list at least one reason).

3. Please describe how achieving this academic goal would help you to achieve broader life goals.

Appendix II

Measure of goal commitment

Note: Goal commitment questions were asked for each goal, individually, and each goal was automatically fed into this part of the survey.

Instructions: Please consider your goal, "X" and rate your level of agreement with the following statements:

1 (strongly disagree) to 7 (strongly agree)

1. It's hard to take this goal seriously. (R)
2. Quite frankly, I don't care if I achieve this goal or not. (R)
3. I am strongly committed to pursuing this goal.
4. It wouldn't take much to make me abandon this goal. (R)
5. I think this is a good goal to shoot for.

Appendix III

Measure of goal-related progress

Note: this questionnaire was assessed during waves two through four

Instructions: Please review the goals you wrote in September and respond to the following questions.

(GOALS WILL BE LISTED FOR PARTICIPANTS TO CONSIDER)

1. Please describe your progress towards achieving your goals

2. Please describe the barriers that have interfered with your goals over the past month

3. Please describe how you will move forward from this point in an effort to achieve your goals

Appendix IV

Measure of trait self-control

Instructions: Using the scale provided, please indicate how much each of the following statements reflects how you typically are.

1 (Not at all) to 5 (Very much)

1. I am good at resisting temptation.

R2. I have a hard time breaking bad habits.

R3. I am lazy.

R4. I say inappropriate things.

R5. I do certain things that are bad for me, if they are fun.

6. I refuse things that are bad for me.

7. I wish I had more self-discipline.

8. People would say that I have iron self- discipline.

R9. Pleasure and fun sometimes keep me from getting work done.

R10. I have trouble concentrating.

11. I am able to work effectively toward long-term goals.

R12. Sometimes I can’t stop myself from doing something, even if I know it is wrong

R13. I often act without thinking through all the alternatives.

Appendix V

Measure of past-month alcohol use

Instructions: To help us evaluate your drinking, we need to get an idea of what your alcohol use was like in the past 30 days. To do this, we would like you to fill out the attached calendar.

✓ Filling out the calendar is not hard!

✓ Try to be as accurate as possible.

✓ We recognize you won't have perfect recall. That's OKAY.

✓ WHAT TO FILL IN

• The idea is to put a number in for **each day** on the calendar.

• On days when you did not drink, you should write a "0".

• On days when you did drink, you should write in the total number of drinks you had.

• We want you to record your drinking on the calendar using Standard Drinks. *For example,* if you had 6 beers, write the number 6 for that day. If you drank two or more different kinds of alcoholic beverages in a day such as 2 beers and 3 glasses of wine, you would write the number 5 for that day.

It's important that something is written for <u>every</u> day, even if it is a "0".

✓ YOUR BEST ESTIMATE

• We realize it isn't easy to recall things with 100% accuracy.

• If you are not sure whether you drank 7 or 11 drinks or whether you drank on a Thursday or a Friday, **give it your best guess!** What is important is that 7 or 11 drinks is very different from

1 or 2 drinks or 25 drinks. The goal is to get a sense of how frequently you drank, how much you drank, and your patterns of drinking.

✓ HELPFUL HINTS

• If you have an appointment book you can use it to help you recall your drinking.

• Try to think about how much you drank on holidays & other events such as birthdays, vacations, or parties.

• If you have regular drinking patterns you can use these to help you recall your drinking. For example, you may have a daily or weekend/weekday pattern, or drink more in the summer or on trips, or you may drink on Wednesdays after playing sports.

✓ COMPLETING THE CALENDAR

• A blank calendar follows these instructions. Please indicate the number of Standard Drinks that you had each day.

  - A standard drink refers to one 12-oz. beer, one 5-oz. glass of wine, or one 1.5-oz. shot of hard liquor.

• In estimating your drinking, be as accurate as possible.

Note: this calendar was automatically populated with the past 30 days of dates.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
date # drinks	date # drinks	date # drinks	date # drinks	date # drinks	date # drinks	date # drinks
date # drinks	date # drinks	date # drinks	date # drinks	date # drinks	date # drinks	date # drinks
date # drinks	date # drinks	date # drinks	date # drinks	date # drinks	date # drinks	date # drinks
date # drinks	date # drinks	date # drinks	date # drinks	date # drinks	date # drinks	date # drinks
date # drinks	date # drinks	date # drinks	date # drinks	date # drinks	date # drinks	date # drinks

Appendix VI

Measure of alcohol expectancies

Instructions: The following questions ask what you would expect to happen if you were under the influence of **ALCOHOL**. Circle from disagree to agree - depending on whether you 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 test. **We want to know what you would expect to happen if you were to drink alcohol, not how you are when you are sober**. Example: If you are always emotional, you would not circle agree as your answer unless you expected to become more emotional if you drank.

When I drink alcohol, I expect that _____:

Disagree	Slightly disagree	Slightly agree	Agree
1	2	3	4

1. I would be outgoing
2. My senses would be dulled
3. I would be humorous
4. My problems would seem worse
5. It would be easier to express my feelings
6. My writing would be impaired
7. I would feel sexy
8. I would have difficulty thinking
9. I would neglect my obligations
10. I would be dominant

11. My head would feel fuzzy

12. I would enjoy sex more

13. I would feel dizzy

14. I would be friendly

15. I would be clumsy

16. It would be easier to act out my fantasies

17. I would be loud, boisterous, or noisy

18. I would be feel peaceful

19. I would be brave and daring

20. I would feel unafraid

21. I would feel creative

22. I would be courageous

23. I would feel shaky or jittery the next day

24. I would feel energetic

25. I would act aggressively

26. My responses would be slow

27. My body would be relaxed

28. I would feel guilty

29. I would feel calm

30. I would feel moody

31. It would be easier to talk to people

32. I would be a better lover

33. I would feel self-critical

34. I would be talkative

35. I would act tough

36. I would take risks

37. I would feel powerful

38. I would act sociable

Appendix VII

Measure of drinking motives

Instructions: Listed below are 20 reasons people might be inclined to drink alcoholic beverages. Using the five-point scale below, decide how frequently your own drinking is motivated by each of the reasons listed.

Almost Never/Never	Some of the time	Half of the time	Most of the time	Almost Always/Always
1	2	3	4	5

I DRINK…

1. To forget my worries.
2. Because your friends pressure you to drink.
3. Because it helps you enjoy a party.
4. Because it helps when you feel depressed or nervous.
5. To be sociable
6. To cheer up when you are in a bad mood.
7. Because you like the feeling.
8. So that others won't kid you about not drinking.
9. Because it's exciting.
10. To get high.
11. Because it makes social gatherings more fun.
12. To fit in with the group you like.

13. Because it gives you a pleasant feeling.
14. Because it improves parties and celebrations.
15. Because it makes me feel good.
16. To celebrate a special occasion with friends.
17. To forget about your problems.
18. Because it's fun.
19. To be liked.
20. So you won't feel left out.

Appendix VIII

Measure of negative alcohol-related consequences

Instructions: Different things happen to people while they are drinking ALCOHOL or because of their ALCOHOL drinking. Several of these things are listed below. Indicate how many times each of these things happened to you WITHIN THE LAST YEAR.

How many times has this happened to you while you were drinking or because of your drinking in the last year?

None 1-2 times 3-5 times More than 5 times

1. Not able to do your homework or study for a test
2. Got into fights with other people (friends, relatives, strangers)
3. Missed out on other things because you spent too much money on alcohol
4. Went to work or school high or drunk
5. Caused shame or embarrassment to someone
6. Neglected your responsibilities
7. Friends or relatives avoided you
8. Felt that you needed more alcohol than you used to in order to get the same effect
9. Tried to control your drinking (tried to drink only at certain times of the day or in certain places, that is, tried to change your pattern of drinking)
10. Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking
11. Noticed a change in your personality

12. Felt that you had a problem with alcohol

13. Missed a day (or part of a day) of school or work

14. Suddenly found yourself in a place that you could not remember getting to

15. Passed out or fainted suddenly

16. Kept drinking when you promised yourself not to

17. Felt physically or psychologically dependent on alcohol

18. Was told by a friend, neighbor or relative to stop or cut down drinking