Drinking to Cope, Negative Affect, and Affect Regulation: A daily diary study

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A dissertation

submitted in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy in Clinical Psychology

University of Washington

2024

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Program Authorized to Offer Degree:

Psychology

University of Washington

Abstract

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Alcohol-related negative consequences remain widespread, and it is crucial to understand etiologic factors that contribute to the development of alcohol-related consequences. Prior research has shown that individuals who report drinking to cope may have increased risks for alcohol-related consequences. It is assumed that drinking to cope implies drinking in response to negative affect, but it is unclear how negative affect, affect regulation strategies, and drinking to cope interact to predict alcohol-related consequences. The study utilized an EMA design to characterize daily risk for alcohol-related consequences. Young adults age 18-22 (N=504) were recruited for intensive longitudinal assessment of substance use and affect. Participants reported their affect, affect regulation strategies, drinking motives, alcohol use, and alcohol-related consequences. Results indicated that current and prior negative affect drive increases in drinking to cope motives. Drinking to cope motives also predicted daily alcohol-related negative consequences. These findings indicate that individuals drink in response to negative affect in specific situations rather than as a general pattern of behavior. Drinking to cope motives were also associated with higher frequency of other maladaptive coping strategies, and predicted

consequences at the daily level. Findings from this study have identified individual differences in emotion regulation and coping-related alcohol use that may contribute to increased alcohol consequences at a daily level, as well as possible targets for intervention. The proposed study represents innovation over prior research due to synthesizing daily fluctuations in affect, affect regulation strategies, and daily motivations to drink and how these relate to consequences at the daily level.

Introduction

Negative consequences from alcohol use are widespread (Esser et al., 2020), and extensive efforts have been made to reduce these consequences, including prevention efforts aimed at reduction in alcohol use, alcohol-impaired driving, and alcohol-related deaths (Hingson, Zha, & Weitzman, 2009, Patrick, Terry-McElrath, Evans-Polce, & Schulenberg, 2020). Despite advances in the field which have provided significant reductions in some domains of these alcohol-related harms, much remains to be learned in order to further prevent negative outcomes from alcohol use. Prevention of these consequences may be particularly important for young adults, since young adulthood is a time of increasing experimentation with substance use, where patterns of substance use may be crystallized into patterns that persist into adulthood (e.g. Patrick et al., 2019). It is particularly important to facilitate healthy behaviors during this time of new learning around substances, and to prevent negative alcohol-related consequences.

Thus, many efforts have been targeted specifically at this population, with interventions focusing on preventing alcohol-related harms among college students and educating on the possible impacts of alcohol. Despite these efforts, rates of heavy episodic drinking and alcohol use disorder remain high (NSDUH, 2019; Haberstick et al., 2014) and 88,000 people per year die of alcohol-related causes (Gonzales et al., 2014). Despite the number of intervention programs that have been developed and are utilized on college campuses, college students continue to experience many negative alcohol-related consequences, including lost productivity, alcohol dependence, and death (Hingson, Zha, and Smyth, 2017). College-aged young adults not enrolled in college also experience these negative impacts (McCabe et al., 2021), showing this is not a problem unique to college students, and that this development age itself is a risk factor as well as a possible opportunity for intervening before greater problems develop.

Prior research suggests the association between amount of alcohol consumed and experience of alcohol-related consequences is only moderate (Prince, Pearson, Bravo, & Montes, 2018), indicating much of the risk for experiencing these consequences remains unexplained. Thus, additional research is needed to improve our understanding of etiologic processes related to alcohol-related consequences and alcohol misuse in young adulthood in particular, in order to improve efforts to reduce these consequences in this population. Investigation of additional factors that contribute to alcohol-related consequences is needed to improve prevention efforts (Perkins, 2002; Prince et al., 2018), as our current interventions are based on our current understanding, which is necessarily incomplete. The age range from 18 - 22 is a high risk period associated with peak lifetime alcohol misuse (Grant et al., 2016), as well as development of alcohol use disorders (Lee et al., 2018), and for this reason is an appropriate and important target for investigation of individual factors which predict risk for potential alcohol misuse and may be viable intervention targets to reduce alcohol-related consequences. With greater understanding of personal risk factors, future interventions can become more targeted and personalized based on these identified targets.

Drinking Motives

While there are many possible aspects of alcohol use that may be important to consider for etiology and prevention of harms from drinking, drinking motives, or self-reported reasons for using alcohol, are important constructs to consider in understanding risk for alcohol-related negative consequences. Different motives for drinking have been shown to have different relations to both alcohol use and alcohol-related negative consequences (Cook et al., 2020; Merrill & Read, 2010; Merrill, Wardell, & Read 2014). The current line of drinking motives research has its origin in Cox and Klinger's incentive motivation model (1988; 1990; 2002).

They argued that people seek out incentives, defined as the combination of an internal need, and an external or environmental condition that can satisfy that desire (Geen, 1995). Within this framework, an individual's drinking is a result of the incentives associated with drinking, and an individual's incentives vary based on their past experiences, learning history, cultural context, beliefs, and more. A person will then choose to engage in alcohol use in a given situation if their appraisal of the positive incentives of use outweigh the negative incentives. In this model, an individual's past experiences and reinforcement history around alcohol use, as well as their beliefs about the effects of alcohol use (which may come from sociocultural context as well as personal experience) combine to form alcohol expectancies, or an individual's expectations about how alcohol will affect them (Cooper et al., 1992). These expectancies can involve beliefs about short and long term effects of use, and direct (or pharmacological) effects, as well as indirect effects (such as social or contextual effects of use). The incentive motivation model conceptualizes that each individual has a complex set of expectancies that then convert into motives for alcohol use in specific situations, as a result of how the individual assesses the possible positive and negative consequences of use, filtered through the lens of their personal set of alcohol expectancies. They then choose to use alcohol (or refrain from use) as a result of the balance of these different incentives in the moment (Cox & Klinger, 2011).

Although there are many possible motives for alcohol use, the typical structure for the most common drinking motives model has four factors (Cooper et al., 1995). These four motive factors focus on the possible reinforcement pathways (positive or negative reinforcement) of alcohol use, as well as whether or not the alcohol use is motivated by internal or external experiences. They can also be defined in terms of approach vs. avoidance motives. The positive reinforcement motives for use are Enhancement and Social (Cooper et al., 1995). Enhancement

motives are defined as drinking in order to achieve a positive internal or emotional experience, such as happiness, exhilaration, fun, or a "high" from alcohol use. Social motives for drinking refer to the tendency to drink in order to facilitate social connectedness, or as a pretext for involvement in social events. Enhancement and Social motives are defined as approach motives, in that the individuals who endorse these motives are intending for alcohol to move them closer to a desired state or goal. The negative reinforcement (or avoidance) motives for use are Conformity and Coping (Cooper et al., 1995). Conformity motives are defined as drinking to avoid negative social (external) consequences such as ostracism or rejection, or to fit in with a desired group of social connections. Coping motives for drinking are defined as using alcohol to regulate undesired internal experiences and emotional states (i.e., negative affect). This four-factor structure of drinking motives has been used and validated in many studies across different cultures, and is typically measured through global self report (e.g. Kuntsche & Kuntsche, 2009; Mezquita et al., 2018; Németh et al., 2012).

Drinking to Cope

Individuals who report high levels of drinking to cope are also at risk for negative outcomes from their alcohol use (Merrill & Read, 2010). College students who have high levels of drinking to cope with different types of emotional distress, and who rely on alcohol to perform this role of emotion regulation, represent a population with unique risk for alcohol-related consequences (Bacio, 2021; Blevins, Abrantes, & Stephens, 2016). These individuals are more likely than their peers who do not endorse these motives for drinking to continue drinking at a problematic level after college graduation, and to not "mature out" of these patterns of excessive alcohol use after transitioning to post-college life (Littlefield, Sher, & Wood, 2010). Drinking to cope may be particularly risky for individuals who drink alone vs. with peers. Negative

experiences may increase the likelihood of later solitary drinking (Mohr et al., 2001). Solitary drinking (but not social drinking) is related to increased alcohol-related consequences through the mediation effect of drinking to cope (Waddell, Corbin, & Marohnic, 2021), indicating that contextual factors must also be considered, and these may interact with drinking to cope to create disproportionate levels of negative alcohol-related consequences. It is important to examine individual differences in vulnerability to the use of alcohol to cope (Hussong et al., 2001). Individuals who drink to cope may also experience more positive consequences, since alcohol consumption produces short term reductions in negative affect and increases in positive affect for many people (Park & Levenson, 2002). This may indicate that drinking to cope may be operating both as positive and negative reinforcement at the same time, possibly driving or exacerbating alcohol dependence.

Drinking to cope is seen from this perspective as a form of avoidance of emotional experiences, and should (theoretically) be associated with more maladaptive drinking because avoidance prevents problem solving and obscures problems, preventing the generation of healthier solutions (Bresin & Mekawi, 2021). The most commonly referenced model of alcohol use assumes motives are related to problems through driving increased use, but coping motives do not typically follow this pattern (Votaw & Witkiewitz, 2021). They may instead resemble a stress generation model (e.g. Conway, Hammen, & Brennan, 2012; Holahan et al., 2005), which theorizes that coping motives (as a manifestation of avoidance coping) contribute to the generation of stressors that then may maintain or exacerbate problems from alcohol use, and that these increased stressors then lead to more alcohol use to cope, with negative consequences from coping-related use continuing in a cyclical manner (Bresin & Mekawi, 2021).

Recent research to better characterize the drinking to cope construct have led to the construct being further divided into drinking to cope with anxiety and depressive symptoms, as these may have different bodily signatures and represent different mood states (Mackinnon et al., 2014) as well as having differing relations with alcohol use and specific negative consequences (Treeby & Bruno, 2012). In contrast, some research has found that the effect of both depressive and anxious symptoms on alcohol-related consequences through the mediated effect of drinking to cope is better modeled through using a single drinking to cope factor rather than symptom-specific coping motives (Bravo & Pearson, 2017). Whether coping motives are better conceptualized as a single construct of drinking to cope with all negative affect, or whether coping motives function differently in regards to outcomes depending on what type of negative affect is present is still an open question, and as a result, it is necessary to assess how coping motives relate to different types of negative affect in real time. However, they clearly relate to a desire to use alcohol as a means of emotion regulation.

Emotion Regulation

Emotion regulation, or the ability to modify the intensity or duration of aversive affective experiences through the use of regulatory skills and strategies (Linehan, 1993), may be a protective factor against coping-motivated drinking. Previous studies have shown deficits in emotion regulation for individuals with alcohol use disorders, most particularly in the presence of negative emotionality (Bradizza et al, 2017). If adaptive internal regulatory strategies are not available, individuals may utilize external strategies such as consuming alcohol in order to attempt to regulate their emotional states, increasing their risk of alcohol-related consequences as well as additional negative affect as a result of negative consequences. Other studies have shown that the intensity of negative affect is indirectly associated with drinking to cope through the

impact of lack of clarity about what specific emotions are being experienced, and through a lack of other available coping strategies (Veilleux et al., 2014). Conversely, the ability to clarify and differentiate between emotions has been shown to be protective against developing alcohol-related problems (Kashdan et al., 2010). The results of this study may be used to identify young adult populations at greater risk for alcohol-related problems, and intervene on factors that might prevent these consequences.

It is possible that our understanding of coping motives may be better situated within the context of other affect regulation processes, since it seems that drinking to cope in particular functions differently from other motives in terms of driving negative consequences. One possible way of doing so may be to consider how drinking to cope is a strategy to regulate unwanted affect, and how an individual may do this in other ways.

Process Models of Affect Regulation

Affect regulation, characterized as managing affective responding so that it does not inhibit progress towards goals (Gross, 1999), could be a potential moderator of the relationship between daily negative affect and drinking to cope motivations. Recent models of this construct emphasize the nature of affect regulation as a process, where regulatory strategies are deployed sequentially in order to achieve closer and closer approximations to a desired affective state, and the process terminates when the goal state is reached. Gross' process model of emotion regulation (Gross, 2015) delineates such an iterative process of regulation, involving three steps. The first step is directing attention to the situation, which is awareness of the relevant features of the situation, both external and internal. The second step is appraisal of the situation, or assessing the situation in terms of what features are causing undesired internal states. The final step is responding to the situation, deploying strategies to alter the situation or the affective response to

the situation to more closely align with desired states. He conceptualizes these steps as potentially being repeated as necessary until the affective response reaches manageable levels and no longer interferes with an individual's goals.

Bonanno and Burton (2013) introduced the concept of "regulatory flexibility," which attempts to bridge the gap between affect regulation and coping, and also conceptualizes the phenomenon as an iterative process. This concept also has three domains with steps 1 & 2 largely overlapping with steps 2 & 3 in Gross' model. The first step is situational appraisal, or assessment of what undesirable affective state is present in a given situation, followed by deployment of coping/regulatory behavioral repertoire, which might be what typically are thought of as coping skills, followed by responsiveness to situational feedback, which might mean awareness of internal changes as a result of coping strategy deployment, or social feedback from outside of the individual. All three domains are conceptualized as varying from person to person. Bonanno and Burton conceptualize each of these domains as individual attributes which vary naturally but can also be affected through outside intervention. These models conceive of emotion regulation strategies as solutions to negative affect, used when negative affect is perceived to be a problem, and modified until affect reaches a more desirable state.

Rationale for the Current Project

There is a growing body of literature showing both affect and decision-making factors are associated with drinking and alcohol-related consequences (Cooper, Frone, Russell, & Mudar, 1995; Park & Levenson, 2002, Shim & Maggs, 2005; Bø, Billieux, & Landrø, 2016). However, the role of emotions in leading to negative alcohol-related consequences has not been fully explained, and, in fact, negative affect alone has been shown to be unrelated to alcohol use at the daily level (Dora et al., 2022). Negative affect may interact with other factors, such as emotion

regulation, coping skills, and drinking motives related to affect regulation or coping, rather than serving as a direct predictor of alcohol-related consequences. Affect-related individual differences may be important to assess and then target within alcohol interventions, and/or may serve as a moderator of intervention efficacy. (McClain et al., 2022). This is an area that is actively being researched, but we do not yet know how these factors function and interact at the daily level. More foundational work is required to assess how incorporating constructs related to emotion regulation, coping, and decision-making processes can improve our current understanding and implementation of change processes in alcohol and other substance use. Despite significant research time and other resources devoted to the problem, alcohol-related negative consequences are still widespread and extremely problematic among young adults. Further research is needed to improve prevention efforts in this population for reducing these alcohol-related harms and the problematic use that leads to them. The current project is a response to the need for more information on how coping motives for alcohol use, negative affect, behavioral repertoire for coping, and environmental factors interact to produce problematic alcohol use and alcohol-related negative consequences.

The current project aimed to situate the phenomenon of drinking to cope within an iterative process conceptualization of affect regulation, consistent with the most recent literature addressing the topic (Bonnano & Burton, 2013; Gross, 2015). The study evaluated at a within-day level whether drinking to cope motives are the result of failed regulation of negative affect, by assessing within-day fluctuations in negative affect and attempted affect regulation strategies. Using EMA methodology, the study sought to determine whether daily negative affect predicts daily drinking to cope motives, and whether drinking to cope is a result of ineffective affect regulation, insufficient strategies to manage negative affect, or if individuals who drink to

cope do not attempt to regulate affect in other ways. Furthermore, the study assessed whether the relation between drinking to cope and increased alcohol-related consequences seen in the literature also holds at a daily level. We hypothesized that drinking to cope motivation would be more likely on days with high mean negative affect. We further hypothesized that ineffective use of affect regulation strategies (defined as use of affect regulation strategies without significant changes in negative affect) over the course of a day would cause increased drinking to cope motivation. Finally, we hypothesized that aggregated daily drinking to cope motivation would also predict daily alcohol-related consequences.

Aim 1: Characterize how negative affect and drinking to cope motives are related at the daily level. The study assessed daily fluctuations in negative affect, and how these fluctuations in affect affected drinking to cope motives within days. **Hypotheses:** Drinking to cope motives will vary across and within days, and within-day fluctuations in coping motives will be associated with both concurrent and prior negative affect. Individuals who report higher negative affect than is typical will also report higher coping motives at the same time point, as well as later in the day.

Aim 2: Assess how the use of affect regulation strategies moderates the relation between negative affect and drinking to cope motives at the daily level. Drinking to cope may represent a failure in more adaptive methods of regulating negative affect, so the study investigated the use and effectiveness of other affect regulation strategies. **Hypotheses:** The concurrent and prospective effects of negative affect on drinking motives will be moderated by use of adaptive affect regulation strategies, such that participants who use adaptive regulation strategies (e.g. reframing, acceptance, seeking emotional support, expressing negative emotions,

and mindfulness/spirituality) will exhibit a weak link between negative affect and coping motives at the same and subsequent assessments.

Aim 3: Understand how drinking to cope motives predict daily consequences. Daily fluctuations in daily drinking to cope motives have not yet been evaluated in relation to daily alcohol-related consequences. The study investigated how daily coping motives (as opposed to other types of drinking motives) predict alcohol-related consequences. **Hypotheses:** For days with higher aggregated drinking to cope motives prior to alcohol use, individuals will be more likely to report alcohol-related consequences and report more consequences.

Overview. Better understanding of how drinking motives and emotional states interact to produce problem drinking and negative alcohol related consequences is necessary in order to design better interventions in the future. Drinking and other substance use is highly contextual, and thus, understanding of how internal states and external environment combine in order to create problematic alcohol use is necessary. This has been done in the past by creating naturalistic laboratory environments that mimic the drinking context in the outside world, such as the BARLAB at university of Washington (Collins, Parks, & Marlatt, 1985) and others across the country. The findings from these laboratory experiments have underscored the importance of environment and context, and how these provide drinking cues and other environmental cues that contribute to substance use and alcohol-related negative consequences (Fromme & Dunn, 1992; Monk et al, 2016). Building from this research demonstrating the importance of contextual factors in alcohol research, the current study followed participants into their own typical contexts, and observed them in their typical environment using ecological momentary assessment (EMA) surveys administered through their smartphones. These EMA surveys

assessed factors such as emotional state, alcohol use, environment, and alcohol related consequences.

Method

Participants. Participants in the parent study (R01DA047247) were young adults (YAs) between the ages of 18-22 (n = 504, 46% female) living in King, Snohomish, or Pierce County, WA, who endorsed using either alcohol or marijuana at least once per week at screening.

Because the goal of the current study was to assess predictors and consequences of drinking to cope motives, the current study excluded parent-study participants who did not endorse any alcohol use, since it was sufficient for inclusion in the parent study to endorse marijuana use alone. Participants who endorsed both alcohol and marijuana use were included; marijuana use was included as a covariate, dividing between alcohol users only and participants who used both alcohol and marijuana, in case emotions and use of coping strategies are different between these two groups. There is some evidence that participants who use both alcohol and marijuana simultaneously may incur increased negative consequences, (Lee, Cadigan, & Patrick, 2017; Linden-Carmichael, Van Doren, Masters, & Lanza, 2020; Stevens et al., 2021), though it is less clear how coping and negative emotionality might differ in simultaneous users.

Participants were predominantly White (54%), with the next highest racial and ethnic identities being biracial/multiracial (23%), East Asian (7.5%), Southeast Asian (4.2%), African-American (3.6%), and Hispanic (3.0%). Forty-five percent of participants identified as cisgender female and 42% identified as cisgender male, with the remaining participants identifying as nonbinary/gender queer/gender nonconforming (8.5%), transgender male (3.0%), transgender female (1.0%), or nongendered (0.2%). Most participants identified as heterosexual (52%), with the remaining participants either identifying as LGBQ+ (47.6%) or declining to respond (n = 2).

If participants indicated more than one value for parental education (e.g., different values for different parents), the highest value was used. Most participants had at least one parent with a college degree or graduate degree (72%).

Recruitment and Study Procedures. Surveys were conducted five times per day for 8 weekends (Thursday-Sunday, with an additional survey on Monday mornings to assess consequences and drinking from the previous night) in order to capture different drinking occasions within a single participant, allowing for comparison of any given drinking event to prior drinking occasions and consequences experienced. Surveys repeatedly assessed alcohol use, affect, use of affect regulation strategies, and drinking to cope over the course of a day, in order to evaluate relations between these factors and how they develop and influence each other over the course of the day. Alcohol-related consequences were assessed in the first survey of the following day. EMA surveys were triggered randomly between the hours of 9am and 11pm, with an hour at minimum between surveys both so that participants did not find the burden of surveys to be too great, but also in order to capture as much within-person variation as possible across the five daily surveys. The study was designed to build on a larger funded grant (R01DA047247, King, PI) assessing the relation between negative urgency and alcohol and marijuana use.

The study recruited through both online and in-person methods, though online recruitment was used most frequently, given safety concerns related to the COVID-19 pandemic. Online recruitment strategies targeted the Seattle metropolitan area within King, Snohomish, and Pierce counties, and flyers were likewise posted in the Seattle metropolitan area. To obtain a sample representative of the area, flyers were posted in neighborhoods with varying socioeconomic status (as indicated by the 2010 Census), and recruitment was stratified by race/ethnicity, gender, and age, in order to avoid oversampling particular groups. We also

recruited both college and non-college-attending young adults to increase sample representativeness, as approximately 36% of King County young adults have not attended any college (US Census Bureau, 2016), and a weakness of prior research in this area is overrepresentation of college attending young adults and lack of representation among young adults who have not attended college.

Online methods involved study advertisements on social media sites such as Facebook, Instagram, and Reddit, as well as on Craigslist, linked to a website with more information about the study. We also used Seattle-specific resources, such as online advertisements in local magazines and newspapers such as The Stranger. Similar recruitment procedures have been effectively used in the Center for the Study of Health and Risk Behaviors to recruit sizable, diverse samples in the past (Patrick, Fairlie, & Lee, 2018; Cadigan, Lee, & Larimer, 2019). We supplemented these online recruitment efforts with in-person recruitment through flyers in locations with a high concentration of young adults such as shopping malls and local colleges. Eligibility for participation was determined through an encrypted online screening survey, and all recruitment materials contained a link to this survey. *Inclusion Criteria* included the following: a) between 18-22 years of age; b) born in the US or moved to US before age of 12; c) reported at least weekly alcohol OR marijuana use; d) inclusion would not cause the sample to exceed the gender cap (50%) for one gender; e) owns a web-enabled smartphone.

Participants who otherwise met the inclusion criteria were only excluded if they *foresaw* missing more than 50% of the EMA surveys due to time conflicts. Participants discussed their schedules with study staff during the baseline, after the study protocol was described in detail, and then all participants were asked about conflicts that predict missing 50% of surveys in order to troubleshoot. In prior studies with similar protocols, very few

participants foresaw missing more than 50% of the surveys. Participants who expected to complete most of the surveys but then failed to complete 50% were not excluded, as data from low responders is equally important. The study screening survey included the requirement of a web-enabled smartphone, which was confirmed during the baseline to ensure participant had a phone they are willing to use for the study. In either case, if participants attended the baseline but were then excluded for one of these reasons, they were given the option to complete only the baseline and earn $50 for participation.

While all eligibility criteria were assessed in the screening survey before any other sessions were scheduled, eligibility was further verified by checking participants' ID at the baseline session to ensure that all information they provided matched their identification, with the exception of preferred name and gender for transgender and gender non-conforming participants. All study procedures were approved by the University of Washington IRB ("Project SMS", UW IRB ID 00006424), including any changes to recruitment and study procedures for protection of research subjects and study staff from any health risks due to the pandemic.

Baseline Assessment. Participants who passed the online screening survey were provided with a consent form prior to meeting with study staff and scheduled for an orientation and review of consent over Zoom with a research assistant trained on study procedures, and then to complete baseline assessment online.

First, participants were oriented to the study through the study information on the consent form and on a condensed information sheet and study schedule provided to each participant, using a Powerpoint with study information displayed via screenshare on Zoom. Study staff then obtained informed consent if the participant had not already given informed consent via DocuSign prior to the orientation. For online orientations, the platform DocuSign was used for

securely obtaining electronic signatures from participants in the research study. The study consent form outlined the purpose of the study, study procedures, potential risks and benefits, and confidentiality information, and provided contact information for the study coordinators. Participants were also provided with a list of community resources at this time. Study staff then answered questions about the study purpose or procedures and allowed participants to surface any issues which came up during their reading of the consent documents. Participants were provided with a copy of the consent form for their records, which included researcher contact information. After completing the consent process, participants registered for the EMA portion of the study through the website SurveySignal.com and were trained on how to access and complete the ecological momentary assessment (EMAs) surveys on their personal phones. SurveySignal.com served the function of sending out the anonymous Qualtrics.com EMA survey link to participants during the EMA portion of the study. Registration involved the participant entering their name, e-mail address, and cell-phone number into an online form on the SurveySignal website. The application then generated an ID number for each participant. This application only stores participant's cell-phone numbers, e-mail address, and their anonymized ID number – not any survey information. SurveySignal only sends out the Qualtrics.com EMA survey links – it is not involved in ongoing data collection past the point of registration, so that participant contact info and research data are kept separate for data security and privacy.

After completing consent process and orientation, participants were able to complete the baseline survey, a computerized questionnaire battery covering demographic information, measures of impulsivity, emotional regulation, psychopathology (such as anxiety and depression), suicidality, their patterns and history of alcohol and marijuana use, and early

childhood adversity (see Measures below). They were paid $50 for completion of this assessment. All compensation was given via online Amazon gift cards.

Ecological Momentary Assessment. During the 8 consecutive weekends (Thursday through Sunday) after the baseline session, participants received text messages 5 times each day, with links to EMA surveys on Qualtrics. These messages were sent with SurveySignal. Each EMA contained approximately 40 items (see Measures). These messages were sent within 5 three-hour blocks between 9am and 11pm, ensuring at least one hour between messages. The initial study design included one reminder message after 30 minutes if participants had not completed their survey. This was changed to two reminders at 20 and 40 minutes after two months of data collection, in order to increase participation. Participants were paid $1 for each completed EMA survey, with up to 160 possible EMA surveys completed during the 8 weekends of EMA data collection. In addition, if 80% of EMA surveys in the weekend were completed, participants were also given a $5 bonus. A variety of procedures were used to ensure EMA compliance, including email and text reminders as well as telephone check-ins if needed; these strategies have resulted in excellent EMA compliance in prior research (Hufford & Shiffman, 2002; Patrick et al., 2018), and proved effective with participants in this study. Survey links remained active for an hour after sending, and participants received reminder texts at 20 and 40 minutes if surveys were not completed, as this has been shown to boost compliance. Since responses were monitored in real time, study staff followed up with participants who missed surveys. Participants who missed a full day of surveys received a phone call to troubleshoot, and a research assistant was on call during the EMA period for participants to contact with any issues. Participants received a reminder call, text or email (depending on their stated contact preference) the day before their first EMA weekend began. They also received a reminder text or e-mail

prior to each weekend of data collection. The majority of study participants responded to at least 80% of the surveys (n=338).

Study surveys contained brief measures to assess perceived impulse control for that time period, social rhythms, recent levels of emotions, and use of emotion regulation skills. In addition, the first assessment of the day asked participants to report any alcohol and marijuana use from the previous day. Once per day, the survey asked participants to predict their substance use for the current day. During the first assessment of the day, the survey asked participants about any consequences from the prior day's substance use. The EMA survey typically took 3-5 minutes or less.

Retention efforts. Participants were occasionally contacted by study staff in a non-demanding way during the follow-up phase in an effort to maintain engagement. They were not contacted more than once a month between follow-up surveys, but were sent a newsletter from the study with information such as sample characteristics, and other information that participants may find interesting.

Measures. Here we list measures from the larger parent study battery relevant to the current project. Other surveys were collected at the same time points, but all data for the purpose of the current project and its related analyses come from either the screening survey, the baseline survey, or the two-month EMA portion of the data collection for the study.

Demographics: During the screening survey and baseline assessment, participants completed questions assessing age, sex, race, ethnicity, whether the individual is a college student or not, and the participant's living situation.

Baseline measures. Baseline measures are not directly used for most analyses, but collecting these measures allows assessment of how much the study population varies on these constructs between the trait level and daily level.

Alcohol-related Consequences: We assessed alcohol-related consequences with the Alcohol Use Disorder Diagnostic Criteria Symptom Indicators (AUDDCSI; α's = .37-.73) (Boness, Lane, & Sher, 2019). This measure of alcohol-related consequences has 33 items and was developed to measure 11 DSM criteria for alcohol use disorder e.g. "Have you ever been under the influence of alcohol in a situation where it increased your chances of getting hurt (e.g. when riding a bicycle, driving, operating machinery, or anything else)?," "Have you ever tried to stop or cut down on your drinking but were unsuccessful?," "Has there ever been a period of several days or more when you spent so much time drinking or recovering from the effects of alcohol that you had little time for anything else?," "Have you ever had a period of time when alcohol was such a focus that you didn't even think about the things you usually enjoy doing?," and asks participants whether or not they had experienced these specific consequences from drinking in the past 12 months, with response options rated on a scale of 0-4 (0 = no experience and 4 = 4+ times).

Drinking Motives: We assessed drinking motives using the Drinking Motives Questionnaire(DMQ; α = .84)(Cooper, Russell, Skinner, & Windle, 1992; Cooper, 1994). The Drinking Motives Questionnaire is the most widely-used self-report measure of motives for drinking. It lists many different reasons for drinking, and asks participants to rate how frequently they engage in drinking for each of the potential reasons, on a 5 point Likert scale from "almost never/never" to "almost always/always. It uses a four-factor model, with the possible motives being Social, e.g. "Because it makes social gatherings more fun," Enhancement, e.g. "Because

you feel more self-confident and sure of yourself," Conformity, e.g. "So you won't feel left out," and Coping, e.g. "To cheer up when you are in a bad mood."

Affect Regulation: We assessed trait affect regulation with the Cognitive Emotion Regulation Questionnaire (CERQ; α's = .68-.93) (Garnefsky & Kraaj, 2007). This is a 36 item scale with 9 different response types for negative events experienced in the past, and participants rate how frequently they experience each type of response to a negative event on a 5 point Likert scale from "almost never" to "almost always." Response types are as follows: Self-blame, e.g. "I feel that I am the one to blame for it," Other-blame, e.g. "I feel that others are responsible for what has happened." Rumination or focus on thought. E.g. "I often think about how I feel about what I have experienced," Catastrophizing, e.g. " I often think that what I have experienced is much worse than what others have experienced," Putting into perspective, e.g. "I think that it all could have been much worse," Positive refocusing, e.g. "I think of nicer things than what I have experienced," Positive reappraisal, e.g. "I think I can learn something from the situation," Acceptance, e.g. "I think that I have to accept that this has happened," and Refocus on planning, e.g. "I think about how to change the situation." These descriptions of behavioral responses will allow the assessment of each individual's typical coping repertoire, or at least the regulatory strategies immediately available to an individual when faced with a situation that requires emotional regulation in order to tolerate. The subscales are scored individually, and higher scores overall represent more potential response types to negative events.

Negative Affect: We assessed trait negative emotionality with the Emotional Reactivity Scale, a 21-item scale with 3 subscales assessing sensitivity, intensity and persistence of people's negative emotional experiences (ERS; α = .94)(Nock, Wedig, Holmberg, & Hooley, 2008). Internal consistencies and example items for each factor are as follows: Emotion Sensitivity (α =

0.88), “My feelings get hurt easily,” Emotion Intensity (α = 0.86), “When I experience emotions, I feel them very strongly/intensely,” and Emotion Persistence (α = 0.81), When I experience emotions, I feel them very strongly/intensely.” (Nock, Wedig, Holmberg, & Hooley, 2008). Participants rated their responses on a 5-point Likert scale from “Not at all like me” to “Completely like me.” This scale was scored and used unidimensionally, since subscales are highly correlated with one another.

EMA measures.

Drinking Motives: We assessed drinking motives at each EMA using five items adapted from existing measures (DMQ(Cooper et al., 1992); M-DMQ(Grant et al., 2007)) with each designed to assess one of five different drinking motives (e.g. enhancement, conformity, social, drinking to cope with anxiety, and drinking to cope with depression), and participants were asked to rate, whether or not they planned to drink later that day, how much each of these motives for drinking would be the reason for drinking if they were to drink. This is similar to the methods used in prior research designs for EMA assessment of drinking motives prior to drinking behavior (Dvorak, Pearson, & Day, 2014). Enhancement motives were assessed with the item “If I drink later today, it will be because I like the feeling,“ conformity motives were assessed with the item “If I drink later today, it will be to fit in with a group I like,” social motives were assessed with the item “If I drink later today, it will be to make a social gathering more enjoyable,” coping with anxiety motives were assessed with the item “If I drink later today, it will be to feel less nervous,” coping with depression motives were assessed with the item “If I drink later today, it will be to feel less depressed.” Participants rated these items on a scale from “not at all” to “extremely” on a Likert scale from 1-5. The coping items were asked at all time points as these are the most important items for the aims of this project; other motives were randomly presented

at each time point such that they will be missing completely at random (MCAR) and can be used for exploratory analyses if desired.

Alcohol Use: We assessed the day's alcohol use through two methods. At all afternoon and evening assessments, participants were asked two items about the quantity of alcohol use and level of intoxication since the prior assessment using the following items: "In the past hour, how many drinks have you had? (If more than 15, select 15)," "How drunk do you feel right now?" (using a slider bar from "not at all drunk" to "very drunk"). At the first assessment of the day, participants were asked a question about the previous day's total quantity of alcohol consumed in standard drinks, followed with information on what constitutes a standard drink for different types of alcohol. Then, participants were asked to estimate approximately how many hours they spent drinking, in order to calculate an estimated BAC. These questions are similar to the Timeline Follow Back (TLFB) method(Sobell & Sobell, 1992), but for a single day's use. If participants missed the first assessment, we asked these items at the second assessment of the day.

Alcohol-Related Consequences: Alcohol-related consequences were assessed at the first assessment of the day (in reference to the previous day's consequences) using the Daily Alcohol-Related Consequences and Evaluations Measure(Lee et al., 2017), a 13-item scale developed to assess alcohol-related consequences at a daily level, using the most commonly experienced alcohol-related consequences, at varying severity levels. (Generalizability coefficients (GCs) within-subjects = .66-.78; GCs between-subjects = .89-.91). Participants were asked to endorse whether or not they have experienced any of these consequences as a result of any substance use the prior day. Some example items from this scale include the following: "I felt nauseated or vomited," "I did something I wouldn't normally do when sober," and "I was

unable to do work/schoolwork." Participants endorsed whether or not they experienced each consequence as a result of their previous day's substance use. Consequences were calculated for all study days where any data was provided on the consequences measure, as well as specifically for days where the participant endorsed drinking. Differences between the results for each variable are reported in findings.

Affect: Affect was assessed with a modified short form of the Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988; Mackinnon et al., 1999) where 14 emotion-related words, from seven emotion categories, both negatively and positively valenced, were selected and randomly presented from a larger word bank of emotion words. The emotion categories include the following: anger, sadness, anxiety, general negative affect, joviality, attentiveness, and serenity. Participants rated the extent to which they experienced each emotion in the last hour from "not at all" to "very much" using slider bars from. 0-100.

Affect Regulation Strategies: We assessed the use of affect regulation strategies in the last hour with a checklist of 7 items adapted from the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefsky & Kraaj, 2007) which measures the use of specific strategies (acceptance, problem solving, rumination, reframing, distraction, emotion suppression, thought suppression) to regulate affect, as well as 4 items adapted from the Brief-COPE (Carver, 1997), an inventory of different coping skills (emotional support, emotional expression/venting, mindfulness/spirituality, self-criticism). These measures of affect regulation strategies contain both positive and negative strategies for coping with emotional distress. Given that there are both adaptive and maladaptive strategies assessed, analyses used a ratio of adaptive to maladaptive strategies in order to capture the relative adaptiveness of each individual's coping strategies.

Analytic Plan

Analytic Models. All analyses were conducted in R (R Core Team, 2023), an open source statistical software with a robust library of packages for testing of many types of models. As the data produced by EMA are nested at multiple levels, (EMA time points within days within individuals), a multilevel modeling approach is required. This was done through the use of General Linear Mixed Models (GLMMs), which can account for nesting within data, and are sufficiently flexible to cope with count variables with positive skew and possibly requiring zero inflation like alcohol use and alcohol-related consequences. Model significance was evaluated with p values. Model 1 used negative affect at the momentary level to predict concurrent coping motives, controlling for covariates, and Model 2 used negative affect at the prior assessment to predict coping motives at the next assessment, once again controlling for covariates. Models 1 & 2 were used to address Aim 1. Model 3 is similar to Model 1, but with affect regulation and an interaction term for affect regulation and negative affect included as predictors of coping motives. Model 4 used daily coping motives to predict daily alcohol-related consequences.

Model Fit. Model fit of nested models (with covariates) was tested with relative fit indices such as AIC, BIC, and -2 log likelihood. Influential outliers were detected using a Cook's distance threshold of 4/n using the influence.ME package (Nieuwenhuis, Te Grotenhuis, & Pelzer, 2012) in R, and models were evaluated both including and excluding these outliers. Cook's distances were calculated for each participant included in the models, and all models were re-analyzed with any participants with a Cook's distance greater than 4/n excluded. Re-estimated models with outliers excluded can be found in Appendix B. The significance of all predictors of interest remained unchanged, with the exception of day-level coping motives predicting alcohol use. Prior to outlier exclusion, these were non-significant, but after outlier exclusion became a significant predictor of increased daily alcohol consequences. Some seasonality effects that were

previously non-significant did become significant predictors of coping motives after outlier exclusion. Race and age became significant predictors of alcohol consequences after outlier exclusion, and seasonality ceased to be significant.

In all models, random intercepts were specified in order to allow for individual differences in levels of variables of interest, and random slopes were tested for negative affect (predicting coping motives) and coping motives (predicting negative consequences).

Centering. For hypotheses about within-person associations (such as how within-day changes in motives are related to affect over the course of a day), we person-centered all predictors (i.e. negative affect, motives, affect regulation strategies, alcohol use) to partial within from between-person variance(Enders & Tofighi, 2007), and we included grand-mean centered person level averages of all EMA predictors to account for between person variance in our variables of interest.

Levels of Clustering. EMAs involve data clustering at multiple levels (EMAs within days within people) and analyses accounted for these levels of clustering, with time lags as appropriate to the hypotheses. For example, hypotheses regarding the association between negative affect and drinking to cope motives were tested with 2 level GLMMs (EMAs nested within people), with negative affect at assessments earlier in the day predicting drinking to cope motives later within the same day, or negative affect predicting drinking to cope motives at the same assessment. Negative alcohol-related consequences and quantity of daily alcohol use are assessed only once per day rather than at each EMA time point, and thus were analyzed with 2 level models of (days nested within people).

Covariates. Analyses were controlled for age, sex, college/non-college status, and living status (where participants live and with whom), as well as seasonality (coded as winter, spring,

summer, and fall), time of day, weekday vs weekend, and observation number. Models using alcohol-related consequences as an outcome were run both controlling for alcohol use quantity and not controlling for alcohol use. Marijuana use was explored as a potential additional covariate to account for differences between polysubstance users and individuals who used alcohol only. The fit of models including marijuana use was compared with the fit of models without marijuana use, using the likelihood ratio test for nested models. Marijuana use was retained as a covariate since its inclusion improved model fit.

Missing data. We utilized the random item presentation feature in EMA surveys, which can increase the number of constructs assessed in an EMA battery while reducing the number of items, which we have successfully implemented in pilot studies. Items for scales are thus missing completely at random (MCAR). Unplanned missing data at the observation level have been characterized using demographic variables and other study constructs assessed at baseline (e.g. alcohol use, affect regulation, negative urgency) in order to predict missingness. Significantly more surveys were completed by female participants, older participants, participants living alone, participants higher in positive urgency at baseline, and participants who reported a higher typical number of drinks per drinking event at baseline. Significantly fewer surveys were completed by nonwhite participants, participants higher in negative urgency at baseline, and participants who reported more frequent drinking events at baseline.

There were different amounts of missing data by participant for different constructs assessed in the study, so models differ in the amount of data contributed. Substance use consequences were only asked at the morning assessment (or the second assessment only if the first assessment was missed), so it was possible for participants to answer prompts about motives, affect, and emotion regulation (asked at all time points) without providing data on

consequences for that day, thus, daily consequences models have more missing data than momentary models containing motives, affect regulation, and negative affect. The following tables illustrate the number of study days and individual assessments contributed for each construct of interest for the entire study, though models had smaller sample sizes based on combinations of missing data on constructs included in the models.

	Total Days	n
Drinking Days	6635	437
Substance Use Consequences--All Days	22309	497
Alcohol Consequences--Drinking Days	5898	487

Table 1. Days contributed to Models

	Total Assessments	n
Coping Motives	45095	489
Negative Affect	50970	497
Emotion Regulation	20691	486

Table 2. Assessments Contributed to Models

Time lags. Appropriate attention was paid to time lags both within and across days, (since consequences for the previous day are assessed the next morning) to ensure that predictors were assessed prior to outcomes for all models. Drinking to cope, affect and affect regulation strategies were assessed at all time points, but data were only used from assessments prior to the onset of drinking to test Aims 1 and 2, as the intent is to assess how these constructs contribute to drinking to cope motives, and affect can be altered by alcohol use. Lagged negative affect to predict coping motives at the following assessment was only calculated within a single day, since the time between assessments within a single day was less than the time difference between the final assessment of the night and the first assessment of the next day, and sleep could also have an impact on affect and motives that was outside the scope of this study.

Non-normality. Daily measures of alcohol consequences are non-normally distributed count variables, with extreme positive skew. We compared the model fit of different count distributions

to the standard linear model to determine which best fits our data (Atkins et al., 2013). Using a Poisson distribution significantly improved model fit over the linear model.

Power. We estimated power using "minimum detectable effect size" (MDES) or the smallest possible effect that could be detected based on the sample size. Sample size differed based on whether data were collected at each EMA or daily, and based on completion rates for individual items. Here we report MDES from the parent grant; we expected to have power to detect somewhat larger effects given our exclusion criteria, although we expected the loss of power to be relatively minimal as only 7% of participants from the pilot study reported no alcohol use, for an expected sample size of 465. MDES for the parent grant was computed as follows: 500 participants complete surveys 5 times per day for 8 consecutive weekends of 4 days. Using an 80% completion rate, the anticipated final number of surveys for analysis was 102.4 EMAs from 25.6 days, for a total of 51,200 EMA observations of drinking motives, negative affect, and affect regulation strategies, and 12,800 EMA-days to observe alcohol use and alcohol-related consequences. MDES was estimated in R with Monte Carlo simulation. Data from the pilot studies were used to estimate the MDES for power ($1 - ß = .80$, $\alpha = .05$, two-tailed test) with G*Power(Faul, Erdfelder, Lang, & Buchner, 2007). The study should have power at the EMA level to detect direct effects or within-person interactions as small as $f^2 = 0.0064$ (very small effect size; ß = .013). This was expected to be more than sufficient to detect effects for the proposed hypotheses, as within-person effect sizes in prior research with similar methods were larger (ß = 0.16-0.19) (Dvorak, Pearson, & Day, 2014).

Results

Drinking to Cope and Demographic Variables. Participants reported significantly lower drinking to cope motives on weekends vs. weekdays. Participants reported higher drinking to

cope motives later in the day as compared to earlier in the day. As participants progressed through the study, they reported higher drinking to cope motives over time, possibly representing increased awareness of these motives as a result of monitoring them, though the magnitude of this effect was very small. Male participants reported significantly lower drinking to cope motives than female participants. Nonwhite participants reported significantly lower drinking to cope motives as compared to white participants. Daily marijuana use was associated with lower drinking to cope motives, and quantity of daily alcohol use was associated with higher drinking to cope motives. These results can be found in Table 3.

	Estimate	95% Confidence Interval	p
Study day	-0.003	[-0.01, 0.00]	0.02
Timepoint	-0.10	[-0.15, -0.05]	< .001
Summer	-0.28	[-0.39, -0.17]	< .001
Fall	-0.24	[-0.34, -0.13]	< .001
Winter	0.12	[0.01, 0.24]	0.036
Living Alone	0.34	[0.21, 0.47]	< .001
Male	-0.16	[-0.24, -0.08]	< .001
Gender Other	0.39	[0.26, 0.51]	< .001
College	-0.23	[-0.32, -0.13]	< .001
Race	0.01	[0.00, 0.02]	0.03
Marijuana Use	-0.29	[-0.38, -0.21]	< .001
Alcohol Quantity	0.08	[0.03, 0.12]	< .001

Table 3. Demographics Associated with Coping Motives

Descriptive statistics for all constructs of interest are shown in the following table:

	Mean	SD
Coping Motives	0.844	1.728
Negative Affect	10.212	14.724
Emotion Regulation Ratio	0.36	0.4
Alcohol Consequences--Drinking Days	0.221	0.786
Substance Use Consequences--All Days	0.75	0.456

Table 4. Descriptive Statistics

Aim 1: Characterize how negative affect and drinking to cope motives are related at the daily level. These analyses only used observations of affect and motives *prior* to the onset of drinking in any given day. We hypothesized that on days with higher than typical (for them) negative affect, individuals will have higher coping motives. Within-day fluctuations in coping motives will be associated with both concurrent and prior negative affect, such that when an individual is experiencing higher than typical (for them) negative affect, their coping motives will also increase. Momentary coping motives will be predicted by same and prior assessment negative affect. Analyses confirmed this hypothesis, with higher momentary negative affect at the current and prior assessments both significantly predicting higher coping motives, such that when individuals were experiencing higher than typical (for them) negative affect, they also had increased coping motives, and increased negative affect preceded increased coping motives, even controlling for coping motives at the prior assessment point.

We also hypothesized that individuals who report higher negative affect than is typical throughout the EMA period will also report higher coping motives overall. Higher average negative affect will be associated with higher average coping motives across the whole study period. Analyses likewise confirmed this hypothesis, such that participants who had higher than average negative affect across all EMAs also had higher than average drinking to cope motives across the study period.

Negative affect and drinking to cope motives are thus related at the momentary level, such that increases in negative affect potentially drive increased levels of drinking to cope. Atypically high levels of negative affect throughout the eight week study period were also associated with atypically high levels of drinking to cope. Summarized significant results can be seen in Tables 2 & 3, with the full results in Appendix A.

	Estimate	95% Confidence Interval	p
Intercept	3.09	[1.03, 5.16]	0.003
Momentary Negative Affect	0.3	[0.25, 0.35]	< .001
Aggregated Negative Affect	0.7	[0.57, 0.83]	< .001
Timepoint	-0.07	[-0.10, -0.04]	< .001
Summer	-0.26	[-0.37, -0.15]	< .001
Fall	-0.26	[-0.39, -0.13]	< .001
Winter	-0.18	[-0.31, -0.06]	0.005
Marijuana Use	-0.12	[-0.19, -0.04]	0.004
Alcohol Quantity	0.07	[0.04, 0.10]	< .001

Table 2 Negative Affect Predicting Coping Motives, Fixed Effects

	Estimate	95% Confidence Interval	p
Intercept	3.59	[1.27, 5.91]	0.003
Prior Momentary Negative Affect	0.04	[0.00, 0.07]	0.04
Aggregated Negative Affect	0.62	[0.47, 0.76]	< .001
Prior Coping Motives	0.48	[0.40, 0.56]	< .001
Timepoint	-0.06	[-0.11, -0.02]	0.008
Summer	-0.13	[-0.26, -0.01]	0.037
Marijuana Use	-0.13	[-0.21, -0.04]	0.005
Alcohol Quantity	0.05	[0.02, 0.09]	0.005

Table 3 Prior Negative Affect Predicting Coping Motives, Fixed Effects

Aim 2: Assess how the use of affect regulation strategies moderates the relation between negative affect and drinking to cope motives at the daily level. Drinking to cope may represent a failure in more adaptive methods of regulating negative affect, so the current study investigated the use and effectiveness of other affect regulation strategies. Our expected findings were that the concurrent and prospective effects of negative affect on drinking motives will be moderated by use of adaptive affect regulation strategies, such that participants who use any adaptive regulation strategies (e.g. reframing, acceptance, seeking emotional support, expressing negative emotions, and mindfulness/spirituality) will exhibit a weak link between negative affect

and coping motives at the same and subsequent assessments. Adaptive and maladaptive emotion regulation strategies were coded into a variable indicating the ratio of adaptive to maladaptive strategies used. Results of this analysis can be seen in Table 4.

We hypothesized that when individuals use adaptive regulation strategies, there will be a weaker relation between negative affect and coping motives than when they don't. In other words: adaptive affect regulation strategies will function as a moderator of the relation between negative affect and coping motives. The hypothesized moderation effect was non-significant as a predictor of increased coping motives over and above the main effects of negative affect and adaptive coping strategy use. However, the main effect of the ratio of adaptive to maladaptive coping strategy use was significant, such that when an individual used a higher proportion of maladaptive coping strategies than was typical for them, they also had increased motivation to drink to cope.

We hypothesized that individuals who use more adaptive regulation strategies will have lower drinking to cope motives, using the ratio of adaptive to maladaptive strategies used. This hypothesized relation was also significant. Individuals who typically endorsed using a higher proportion of maladaptive affect regulation strategies across the study period also endorsed higher coping motives across all EMA surveys. Summarized significant results can be seen in table 4, with the full results in Appendix A.

	Estimate	95% Confidence Interval	p
Intercept	4.17	[1.35, 6.98]	0.004
Momentary Negative Affect	0.33	[0.27, 0.39]	< .001
Aggregated Negative Affect	0.69	[0.52, 0.86]	< .001
Momentary Emotion Regulation	0.06	[0.01, 0.11]	0.015
Aggregated Emotion Regulation	0.2	[0.03, 0.38]	0.026
Timepoint	-0.12	[-0.18, -0.05]	< .001
Summer	-0.42	[-0.62, -0.21]	< .001
Fall	-0.41	[-0.65, -0.17]	< .001
Marijuana Use	-0.17	[-0.31, -0.02]	0.03
Alcohol Quantity	0.1	[0.04, 0.16]	0.001
Negative Affect x Emotion Regulation	-0.03	[-0.08, 0.01]	0.126

Table 4 Negative Affect and Emotion Regulation predicting Coping Motives, Fixed Effects

Aim 3: Understand how drinking to cope motives predict daily consequences. Although prior cross-sectional research has not found that drinking motives are related to quantity of alcohol consumed as much as alcohol-related consequences, we will test whether that effect is replicated with EMA data. We expected that for days with higher aggregated drinking to cope motives prior to alcohol use, individuals will be more likely to report alcohol-related consequences and report more consequences.

We hypothesized that when individuals have higher than typical (for them) drinking to cope motives prior to using alcohol, they will be more likely to report consequences and have more consequences. Average levels of drinking to cope motives prior to the initiation of alcohol use will predict next-day consequences. On days where individuals reported drinking, this relation was significant in the expected direction, but after including a grand mean centered term for aggregated coping motives throughout the entire study period it ceased to be significant. However, daily coping motives were a significant positive predictor for consequences on all study days, even after controlling for alcohol use.

We hypothesized that people who have higher drinking to cope motives in general will experience more consequences than people with lower drinking to cope motives. Average

drinking to cope motives will be associated with average number of consequences in the whole sample, such that higher motives are associated with more consequences. This hypothesized relation was significant, such that individuals with higher average levels of drinking to cope motives also had more consequences from alcohol use over the study period. Summarized significant results can be seen in tables 5 & 6, with the full results in Appendix A.

	Estimate	95% Confidence Interval	p
Intercept	-5.02	[-8.75, -1.28]	0.008
Daily Coping Motives	0.04	[-0.04, 0.11]	0.323
Aggregated Coping Motives	0.36	[0.15, 0.56]	< .001
Weekend	-0.25	[-0.43, -0.07]	0.007
Summer	-0.40	[-0.75, -0.04]	0.028
Alcohol Quantity	0.93	[0.87, 1.00]	< .001
Marijuana Use	-0.57	[-0.81, -0.33]	< .001

Table 5. Consequences: fixed effects for alcohol use days

	Estimate	95% Confidence Interval	p
Intercept	-1.12	[-4.03, 1.80]	0.454
Daily Coping Motives	0.07	[0.01, 0.13]	0.02
Aggregated Coping Motives	0.31	[0.15, 0.46]	< .001
Weekend	-0.32	[-0.46, -0.17]	< .001
Alcohol Quantity	0.6	[0.56, 0.65]	< .001
Marijuana Use	-0.91	[-1.10, -0.72]	< .001

Table 6 Consequences: fixed effects for all study days

Discussion

Individuals who drink to cope represent a population uniquely at risk for negative outcomes from alcohol use, and this behavioral pattern is likely influenced by both internal and external contextual factors. Better understanding of these factors may aid understanding of how an individual transitions from drinking in response to negative affect in a single instance to developing a consistent pattern of coping-motivated drinking. The results of this study replicate earlier work indicating that negative affect is associated with coping motives and coping motives

are associated with alcohol-related consequences at the between-persons level, but extends this work to characterize the within-person dynamics of these constructs. This study provides valuable information for future research leading to improved prevention efforts for negative alcohol-related consequences. For example, both a typical pattern of drinking to cope and higher than usual momentary coping motives can contribute to increased negative consequences from substance use. The study also provides some elucidation of the relation between negative affect, drinking to cope, and maladaptive coping strategies, as well as how these can contribute to negative alcohol-related consequences. Specifically, understanding that negative affect precedes and can heighten a desire to drink to cope underscores the importance of providing young adults with more adaptive ways of regulating their emotions, especially since drinking to cope motives were also associated with other maladaptive regulation strategies. This information could be used clinically to prevent development of alcohol use disorders through targeted training on more adaptive ways to regulate negative affect. Results of the current study could be used to identify individualized treatment targets and incorporate them into smartphone-based interventions for alcohol use and consequences (i.e. Matalenas, McLaughlin, Chen, & Daughters, 2015; Gustafson et al., 2014). By identifying situational predictors of risk, such as the use of certain emotion regulation strategies in the presence of negative affect or contextual changes in motives, this study also extends potential intervention targets.

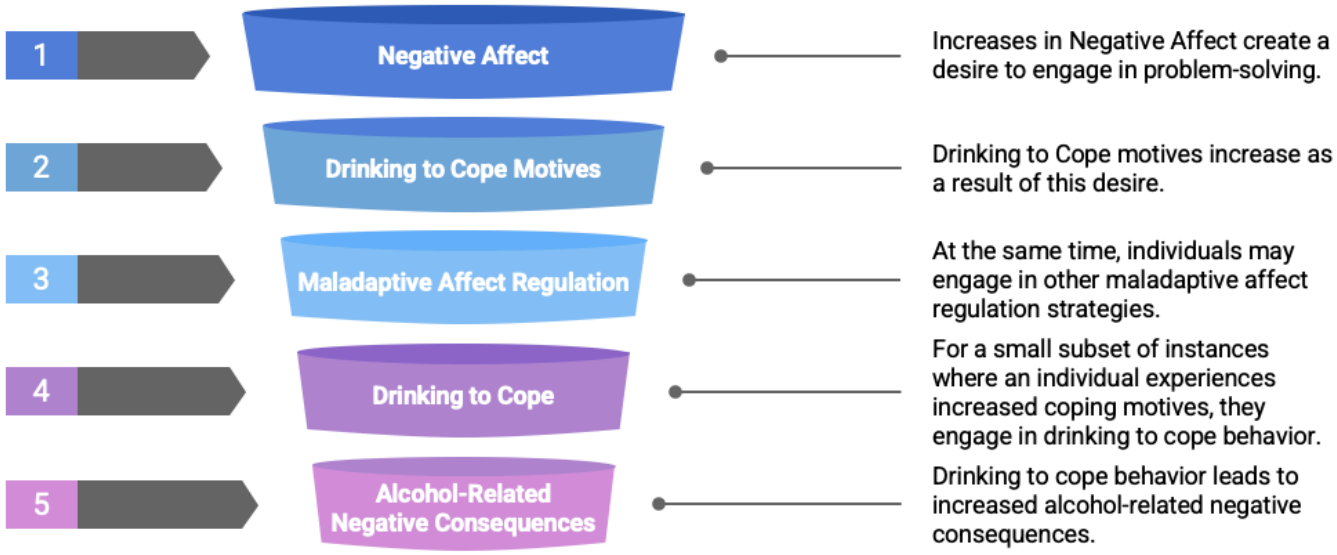

Figure 1. Possible Behavioral Pathway from Negative Affect to Alcohol-Related Negative Consequences

Implications for the Motivational Model of Alcohol Use

The relation between coping motives and momentary negative affect may have implications for the incentive motivation model of substance use (Cox & Klinger, 1988, 1990, 2002, 2011) This model conceptualizes an individual's alcohol use as being incentivized by many possible factors, including learning history and expectancies, where an individual's motives for use directly precede and drive their alcohol use, and through alcohol use, alcohol-related consequences. However, coping motives for use do not always neatly fit with this model, and differ based on the type of negative affect assessed.

It is clear from results of the current study that coping motives fluctuate at the momentary level in response to both current and prior negative affect. Similar to results of prior research, while momentary negative affect appears to be related to spikes in coping motives, these spikes do not always convert to drinking behavior. It is possible that this conversion from negative-affect driven desire for drinking to actual drinking is significantly rarer than increases in

coping motives. (and perhaps *when* this conversion does happen, it is associated with higher rates of consequences). In this conceptualization, the incentives of refraining from alcohol use are often higher than the incentives for use, and thus an individual may experience increased desire to drink to cope but not engage in the behavior in order to avoid undesired consequences.

From Momentary Drive to Maladaptive Pattern

It is also currently not understood how drinking motives transition from a momentary drive to a problematic pattern of behavior. The results of this study indicate that frequent endorsement of higher than average drinking to cope motives is also associated with higher rates of alcohol-related consequences. The momentary results are also interesting in this regard. Drinking to cope motives are also associated with other types of maladaptive affect regulation strategies at the momentary level. In other words, unhealthy coping strategies tend to go together, and the possible outcomes of these problematic strategies could lead to further problems. A question for future studies is how the incentives of these maladaptive affect regulation strategies develop and are maintained over time. Is there something special about drinking to cope, or is it merely another maladaptive strategy that may have a disproportionately negative impact on an individual's life?

Coping Motives and Affect Regulation

Understanding how momentary or daily processes result in longer-term patterns associated with harmful consequences of drinking is important so that we can prevent these patterns from developing, preferably before they start causing problems. Young adults who drink primarily for coping reasons represent a subset of the young adult population, since many young adults drink primarily for other reasons such as enhancement or social motives (Cooper et al., 1995). However, the subset of individuals who drink for coping reasons is at risk for increased

alcohol-related negative consequences. Drinking for tension reduction (Conger, 1956) or self-medication of negative affect (Abrams and Niaura, 1987) may be associated with a lack of ability to regulate emotion in a less risky manner, given the high rates of consequences related to drinking to cope. The reinforcing effect of alcohol for these individuals is likely to be relief from emotional distress (Maisto et al., 1999), and the induction of positive mood as a result of alcohol use may serve as a powerful attraction for alcohol use among this population specifically (Cooper, Russell, & George, 1988). Future research is needed on how coping skills might be improved in this population, and how alcohol use can be removed from an individual's coping repertoire and replaced with more adaptive strategies.

Drinking to cope might not be the first response to negative affect, and, in fact, might be representative of a failure of more adaptive responding. Beyond the analyses involved in the current study, the data collected could be used to take a more detailed look at negative affect and the strategies an individual uses to cope with it, possibly looking at the individual items on the affect regulation measure. Further, aspects of affect regulation and negative affect could be investigated as predictors of whether or not drinking to cope motives convert to drinking to cope behavior.

The complexity of inter-relation between the constructs of interests and coping processes may also account for the mixed findings of prior EMA studies, since these dynamics may happen on a time scale of seconds or minutes rather than over hours, as is typical for even higher frequency EMA studies. Additionally, drinking to cope may be only one possible option for regulating affect, and may not be as problematic if it is one of a large repertoire of coping strategies rather than the main strategy. While drinking to cope appears to have an effect at the daily level, once it becomes a habitual or primary means of regulating affect it appears to be

more impactful. However, in order to more effectively intervene, we must learn how these factors at a momentary level crystallize into more general patterns of behavior.

With respect to intervention implications of the relation between coping motives and negative affect, research has shown that increasing the ability to regulate affect through targeted training can improve outcomes for individuals in treatment for alcohol use disorders (Stasiewicz, Bradizza, & Slosman, 2018). Preliminary studies indicate interventions focusing on coping skills acquisition may be effective for reducing alcohol-related harms through increases in coping ability, though the study in question found this effect in a sample of alcohol-dependent individuals rather than young adults with a variety of typical use patterns who might or might not meet criteria for alcohol use disorders (Litt, Kadden, & Kabela-Cormier, 2009). Results of the current study indicate that young adults are using alcohol as a means to regulate their negative affect, or out of expectations that alcohol can serve that purpose. This implies a potential benefit of including emotion-regulation and other coping skills training as a viable area for intervention, perhaps in a similar way to personalized normative feedback interventions (e.g. Dotson, Dunn, & Bowers, 2015; Lewis & Neighbors, 2007; Young et al., 2018). Individuals who drink heavily and also have concurrent depression and anxiety have been shown to derive greater benefit from alcohol interventions that include skills for coping with and regulating negative emotions (Whiteside, 2010). Future studies in this area could look at momentary interventions, perhaps involving skills coaching when negative affect is driving increased coping motives and likelihood of coping-motivated drinking.

Limitations.

Limitations of this study include the fact that all measures were self report, and subject to individual participants' perceptions and bias. The study was limited to the geographic area of the

Seattle metro, and thus the results would not necessarily generalize to the rest of the country. Participants did not have to report high levels of drinking in order to be eligible for the study, and thus the rates of consequences throughout were relatively low. Finally, we had issues with the measurement of drinking to cope, such that it was intended to be a slider bar from 0-100, but was converted into a 1-5 likert scale in the database due to a programming error.

Future Directions.

The results of this study indicate some future directions for this work to continue. Given that the relation between coping motives and negative alcohol-related consequences is not a simple one, a good first step would be to better characterize that relation. It is possible that the relation is not linear, or that there are multiple subgroups within the study population who have different relations between coping motives and consequences. With some of the other data collected as part of this study, participants could be split into high and low risk drinkers and whether the results are the same in both groups could be tested. There may be different trajectories through which drinking to cope influences consequences, or drinking to cope may be most damaging in the presence of other risk factors. Drinking to cope appears to impact consequences in some way, but if it only has a significant negative impact under some circumstances, it is important to understand how and why in order to prevent harm in those specific circumstances.

Future research beyond the current analysis may assess why and how coping motives for alcohol use relate to alcohol-related consequences at the daily level, as this relation appears complex and nuanced. Given that coping motives appear to have an impact over and above the impact of increased consumption, further studies could attempt to explain this finding by examining the circumstances under which coping motives have a greater or lesser effect, and

how these motives develop over time. It is possible that coping motives are associated with contextual factors around drinking that are not captured with typical consumption metrics. In other words, the quantity of alcohol use may not be what primarily drives problems, but rather, how an individual drinks. Coping motives may be associated with drinking alone, which has higher rates of negative consequences than drinking with others. Drinking to cope may also be associated with different drinking behaviors, such as drinking liquor and shots rather than beverages with lower alcohol content. This could have multiple possible ways of obscuring a quantity-consequences relation. When drinking liquor, individuals may have a higher likelihood of underestimating consumption than when drinking lower ABV beverages. They may also drink faster as a result of the lower volume consumed, leading to higher maximum BAC even with the same amount of alcohol consumed. Some of these questions could be addressed with further analysis of this study's data.

Related to but distinct from contextual factors, individuals who drink to cope may not access potential positive reinforcement from alcohol use, or not to the same degree as individuals who drink primarily for other reasons. This positive reinforcement may take many different forms, such as increased social connectedness through spending time with others, or positive mood induction through drinking. These factors may be lessened when drinking alcohol primarily to reduce negative mood, or may result in an individual who is still experiencing negative mood but also has reduced inhibitory control as a result of alcohol use. Thus, they might be more likely to engage in impulsive behaviors as an attempt to regulate that mood, which then lead to negative consequences.

Replicating the results of this study in a clinical population, possibly individuals who meet criteria for alcohol use disorder, could indicate whether the pattern is the same or different

in a clinical population, and possibly identify treatment targets in a population at higher risk for consequences. Comparing the results of a similar study between a clinical sample and young adults with a variety of drinking patterns could allow early identification of young adults at risk for developing substance use disorders before their issues reach a clinical level. If emotion regulation deficits or emotional volatility are implicated in the development of alcohol problems, understanding that would be an important step towards addressing these problems.

Drinking to cope may be a result of an underlying vulnerability, in which individuals are both more prone to negative affect and also have an emotional system that is more sensitive to disruption. This might be a result of a negativity bias of perception, similar to that seen in depression and anxiety disorders, where an individual's appraisal of their consequences and outcomes from drinking could be more negative than an individual without a similar bias. It could also be that these individuals have other vulnerabilities, such as a lack of skills to regulate emotion, a lack of social support, or other contextual or internal factors that increase the likelihood that alcohol use will disrupt their emotional functioning or otherwise interfere with their lives and goals. In this case, alcohol use would be functioning as a stressor, increasing the strain on an individual in a way that they do not have the resources to tolerate or prevent. There have been studies indicating that drinking to cope is more common among those with other demographic-based stressors (e.g. in adolescents from low-income families; Stapinski et al., 2016), so the problems from alcohol use might be a result of a resource deficit in an area that could otherwise aid in prevention of consequences.

Results from this study open up further avenues of inquiry in order to prevent alcohol-related negative consequences and possibly even the development of alcohol use disorders.

Appendix A. Full Model Results.

	Estimate	95% CI	*p*
Intercept	3.09	[1.03, 5.16]	0.003
Momentary Negative Affect	0.3	[0.25, 0.35]	< .001
Aggregated Negative Affect	0.7	[0.57, 0.83]	< .001
Weekend	-0.02	[-0.06, 0.03]	0.437
Study Day	0	[0.00, 0.00]	0.114
Timepoint	-0.07	[-0.10, -0.04]	< .001
Summer	-0.26	[-0.37, -0.15]	< .001
Fall	-0.26	[-0.39, -0.13]	< .001
Winter	-0.18	[-0.31, -0.06]	0.005
Living Alone	0.16	[-0.22, 0.54]	0.413
Male	0.02	[-0.22, 0.26]	0.879
Other	0.16	[-0.20, 0.53]	0.389
College Status	-0.15	[-0.44, 0.14]	0.305
Age	-0.07	[-0.16, 0.03]	0.173
Race	-0.01	[-0.04, 0.02]	0.445
Marijuana Use	-0.12	[-0.19, -0.04]	0.004
Alcohol Quantity	0.07	[0.04, 0.10]	< .001

Momentary Negative Affect Predicting Coping Motives

	Estimate	95% CI	*p*
Intercept	3.59	[1.27, 5.91]	0.003
Prior Momentary Negative Affect	0.04	[0.00, 0.07]	0.04
Aggregated Negative Affect	0.62	[0.47, 0.76]	< .001
Prior Coping Motives	0.48	[0.40, 0.56]	< .001
Weekend	0	[-0.05, 0.05]	0.962
Study day	0	[0.00, 0.00]	0.823
Timepoint	-0.06	[-0.11, -0.02]	0.008
Summer	-0.13	[-0.26, -0.01]	0.037
Fall	-0.13	[-0.28, 0.02]	0.09
Winter	-0.04	[-0.18, 0.11]	0.624
Living Alone	0.29	[-0.14, 0.72]	0.192
Male	-0.02	[-0.29, 0.25]	0.888
Other	0.29	[-0.11, 0.68]	0.157
College Status	-0.17	[-0.49, 0.15]	0.297
Age	-0.09	[-0.20, 0.02]	0.097
Race	-0.03	[-0.06, 0.00]	0.096
Marijuana Use	-0.13	[-0.21, -0.04]	0.005
Alcohol Quantity	0.05	[0.02, 0.09]	0.005

Prior Assessment Momentary Negative Affect Predicting Coping Motives

	Estimate	95% CI	*p*
Intercept	4.17	[1.35, 6.98]	0.004
Momentary Negative Affect	0.33	[0.27, 0.39]	< .001
Aggregated Negative Affect	0.69	[0.52, 0.86]	< .001
Momentary Affect Regulation	0.06	[0.01, 0.11]	0.015
Aggregated Affect Regulation	0.2	[0.03, 0.38]	0.026
Weekend	-0.04	[-0.14, 0.05]	0.363
Study Day	0	[0.00, 0.00]	0.318
Timepoint	-0.12	[-0.18, -0.05]	< .001
Summer	-0.42	[-0.62, -0.21]	< .001
Fall	-0.41	[-0.65, -0.17]	< .001
Winter	-0.17	[-0.40, 0.06]	0.151
Living Alone	0.19	[-0.31, 0.69]	0.449
Male	0.02	[-0.31, 0.36]	0.9
Other	0.27	[-0.19, 0.74]	0.252
College Status	-0.29	[-0.68, 0.09]	0.137
Age	-0.09	[-0.22, 0.04]	0.171
Race	-0.01	[-0.04, 0.03]	0.651
Marijuana Use	-0.17	[-0.31, -0.02]	0.03
Alcohol Quantity	0.1	[0.04, 0.16]	0.001
Negative Affect x Affect Regulation	-0.03	[-0.08, 0.01]	0.126

Negative Affect, Affect Regulation, and Interaction predicting Momentary Coping Motives

	Estimate	95% CI	*p*
Intercept	-5.02	[-8.75, -1.28]	0.008
Daily Coping Motives	0.04	[-0.04, 0.11]	0.323
Aggregated Coping Motives	0.36	[0.15, 0.56]	< .001
Weekend	-0.25	[-0.43, -0.07]	0.007
Study Day	0	[0.00, 0.01]	0.46
Summer	-0.4	[-0.75, -0.04]	0.028
Fall	-0.25	[-0.63, 0.13]	0.193
Winter	0	[-0.34, 0.35]	0.996
College Student Status	0.13	[-0.38, 0.64]	0.605
Living Alone	-0.22	[-0.95, 0.50]	0.547
Male	-0.03	[-0.47, 0.42]	0.899
Other	-0.52	[-1.16, 0.13]	0.117
Age	0.15	[-0.02, 0.32]	0.087
Race	-0.04	[-0.09, 0.01]	0.093
Alcohol Quantity	0.93	[0.87, 1.00]	< .001
Marijuana Use	-0.57	[-0.81, -0.33]	< .001

Daily Coping Motives Predicting Alcohol Consequences

	Estimate	95% CI	*p*
Intercept	-1.12	[-4.03, 1.80]	0.454
Daily Coping Motives	0.07	[0.01, 0.13]	0.02
Aggregated Coping Motives	0.31	[0.15, 0.46]	< .001
Weekend	-0.32	[-0.46, -0.17]	< .001
Study Day	0	[0.00, 0.00]	0.745
Summer	-0.28	[-0.56, 0.01]	0.061
Fall	-0.07	[-0.37, 0.24]	0.669
Winter	0.01	[-0.27, 0.28]	0.952
College Student Status	-0.02	[-0.42, 0.37]	0.903
Living Alone	-0.35	[-0.93, 0.23]	0.238
Male	-0.15	[-0.50, 0.20]	0.401
Other	-0.05	[-0.54, 0.44]	0.845
Age	0.03	[-0.10, 0.16]	0.661
Race	-0.03	[-0.07, 0.01]	0.093
Alcohol Quantity	0.6	[0.56, 0.65]	< .001
Marijuana Use	-0.91	[-1.10, -0.72]	< .001

Daily Coping Motives Predicting Consequences on All Days

Appendix B. Model Results with Outliers Excluded.

	Estimate	95% CI	*p*
Intercept	2.56	[0.70, 4.42]	0.007
Momentary Negative Affect	0.28	[0.23, 0.33]	< .001
Aggregated Negative Affect	0.66	[0.54, 0.77]	< .001
Weekend	-0.02	[-0.06, 0.03]	0.448
Study Day	0	[0.00, 0.00]	0.186
Timepoint	-0.07	[-0.10, -0.04]	< .001
Summer	-0.24	[-0.34, -0.14]	< .001
Fall	-0.25	[-0.38, -0.13]	< .001
Winter	-0.26	[-0.38, -0.14]	< .001
Living Alone	0.06	[-0.29, 0.40]	0.743
Male	0.04	[-0.17, 0.26]	0.695
Other	0.17	[-0.17, 0.50]	0.326
College Status	-0.13	[-0.39, 0.12]	0.312
Age	-0.05	[-0.13, 0.04]	0.294
Race	0	[-0.03, 0.02]	0.879
Marijuana Use	-0.12	[-0.20, -0.05]	0.001
Alcohol Quantity	0.07	[0.04, 0.09]	< .001

Momentary Negative Affect Predicting Coping Motives

	Estimate	95% CI	*p*
Intercept	2.74	[0.55, 4.94]	0.015
Prior Momentary Negative Affect	0.04	[0.00, 0.07]	0.035
Aggregated Negative Affect	0.62	[0.49, 0.76]	< .001
Prior Coping Motives	0.47	[0.40, 0.55]	< .001
Weekend	-0.01	[-0.06, 0.04]	0.713
Study day	0	[0.00, 0.00]	0.863
Timepoint	-0.06	[-0.10, -0.01]	0.012
Summer	-0.14	[-0.26, -0.01]	0.03
Fall	-0.15	[-0.30, 0.00]	0.045
Winter	-0.06	[-0.20, 0.08]	0.401
Living Alone	0.05	[-0.36, 0.46]	0.821
Male	-0.06	[-0.31, 0.20]	0.659
Other	0.34	[-0.03, 0.70]	0.073
College Status	-0.06	[-0.36, 0.25]	0.712
Age	-0.05	[-0.15, 0.05]	0.299
Race	-0.02	[-0.05, 0.00]	0.092
Marijuana Use	-0.14	[-0.22, -0.05]	0.002
Alcohol Quantity	0.05	[0.01, 0.08]	0.01

Prior Assessment Momentary Negative Affect Predicting Coping Motives

	Estimate	95% CI	*p*
Intercept	3.72	[1.02, 6.43]	0.007
Momentary Negative Affect	0.32	[0.26, 0.39]	< .001
Aggregated Negative Affect	0.65	[0.48, 0.81]	< .001
Momentary Affect Regulation	0.05	[0.01, 0.10]	0.028
Aggregated Affect Regulation	0.11	[-0.06, 0.28]	0.21
Weekend	-0.03	[-0.12, 0.07]	0.586
Study Day	0	[0.00, 0.00]	0.611
Timepoint	-0.12	[-0.18, -0.06]	< .001
Summer	-0.38	[-0.57, -0.18]	< .001
Fall	-0.39	[-0.63, -0.15]	0.002
Winter	-0.31	[-0.53, -0.08]	0.009
Living Alone	0.02	[-0.46, 0.50]	0.93
Male	0.03	[-0.29, 0.35]	0.861
Other	0.33	[-0.11, 0.78]	0.145
College Status	-0.26	[-0.63, 0.11]	0.164
Age	-0.07	[-0.20, 0.05]	0.247
Race	0	[-0.04, 0.03]	0.927
Marijuana Use	-0.17	[-0.32, -0.02]	0.024
Alcohol Quantity	0.09	[0.03, 0.15]	0.003
Negative Affect x Affect Regulation	-0.03	[-0.07, 0.01]	0.148

Negative Affect, Affect Regulation, and Interaction predicting Momentary Coping Motives

	Estimate	95% CI	*p*
Intercept	-5.02	-5.68	[-9.43, -1.93]
Daily Coping Motives	0.04	0.1	[0.03, 0.18]
Aggregated Coping Motives	0.36	0.36	[0.16, 0.56]
Weekend	-0.25	-0.3	[-0.49, -0.11]
Study Day	0	0	[0.00, 0.01]
Summer	-0.4	-0.34	[-0.70, 0.01]
Fall	-0.25	-0.16	[-0.56, 0.24]
Winter	0	-0.16	[-0.53, 0.20]
College Student Status	0.13	0.19	[-0.31, 0.70]
Living Alone	-0.22	-0.3	[-1.04, 0.44]
Male	-0.03	-0.02	[-0.47, 0.42]
Other	-0.52	-0.32	[-0.95, 0.32]
Age	0.15	0.18	[0.00, 0.35]
Race	-0.04	-0.06	[-0.11, -0.01]
Alcohol Quantity	0.93	0.96	[0.89, 1.02]
Marijuana Use	-0.57	-0.52	[-0.78, -0.26]

Daily Coping Motives Predicting Alcohol Consequences

	Estimate	95% CI	*p*
Intercept	-1.44	[-4.34, 1.46]	0.331
Daily Coping Motives	0.09	[0.03, 0.15]	0.004
Aggregated Coping Motives	0.3	[0.15, 0.45]	< .001
Weekend	-0.34	[-0.49, -0.19]	< .001
Study Day	0	[0.00, 0.00]	0.713
Summer	-0.25	[-0.54, 0.04]	0.094
Fall	-0.05	[-0.37, 0.27]	0.758
Winter	-0.09	[-0.37, 0.20]	0.545
College Student Status	0.01	[-0.39, 0.41]	0.962
Living Alone	-0.39	[-0.97, 0.19]	0.189
Male	-0.14	[-0.49, 0.21]	0.434
Other	0.08	[-0.41, 0.56]	0.748
Age	0.04	[-0.09, 0.18]	0.51
Race	-0.04	[-0.08, 0.00]	0.029
Alcohol Quantity	0.61	[0.56, 0.65]	< .001
Marijuana Use	-0.91	[-1.11, -0.71]	< .001

Daily Coping Motives Predicting Consequences on All Days

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