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Trait-based Affective Processes in Alcohol-Involved Risk Behaviors

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Abstract

This study tested a theoretical model of alcohol use, markers of extreme intoxication, and risk behavior as a function of trait affect, distress tolerance, and affect-based behavior dysregulation. Positive affective pathways to risk behavior were primarily expected to be indirect via high levels of alcohol use, while negative affect paths were expected to be more directly associated with engagement in risk behavior. In addition, we expected trait affectivity and distress tolerance would primarily exhibit relationships with alcohol use and problems through behavioral dysregulation occurring during extreme affective states. To evaluate these hypotheses, we tested a SEM with three alcohol-related outcomes: “Typical” alcohol use, “blackout” drinking, and risk behavior. Results were complex, but generally supported the hypotheses. High trait negative affect and low tolerance for affective distress contribute to difficulty controlling behavior when negatively aroused and this is directly associated with increased risk behavior when drinking. In contrast, associations between positive urgency and risk behaviors are indirect via increased alcohol consumption. Positive affectivity exhibited both inverse and positive effects in the model, with the net effect on alcohol outcomes being insignificant. These findings contribute important information about the distinct pathways between affect, alcohol use, and alcohol-involved risk behavior among college students.

Keywords

Risk behavior; alcohol; impulsivity; affect

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AUTHOR DISCLOSURES

Contributors

Tyler Wray and Jeffrey Simons designed the study, conducted the statistical analysis, and wrote preliminary drafts of the manuscripts. Rob Dvorak and Raluca Gaher conducted literature searches, provided theoretical and statistical consultation, and wrote final drafts of the manuscript. All authors approved of the final manuscript.

Conflict of Interest

All authors declare that they have no conflicts of interest.

1. Introduction

A substantial amount of the public health costs incurred as a result of alcohol-related problems can be attributed to alcohol-associated “externalizing problems,” or risk behaviors (Hingson, Heeren, Winter, & Wechsler, 2005; Kassel, Wardle, Heinz, & Greenstein, 2010). Associations between alcohol consumption and various risk behaviors may reflect a combination of acute effects of intoxication and dispositional factors, such as impulsivity, that increase risk behavior among drinkers. In this regard, several studies indicate that forms of disinhibition are associated with alcohol-related problems over and above measures of typical quantity and frequency of alcohol use (Magid, MacLean, & Colder, 2008; Settles et al., 2012; Simons, Carey, & Wills, 2009; Simons, Gaher, Correia, Hansen, & Christopher, 2005). However, there is wide variability in both alcohol consumption patterns and risk for associated problems. Currently, it is unclear whether such results indicate a specific association between disinhibition and alcohol-related behavioral problems or whether disinhibition predicts the likelihood of isolated drinking events characterized by extreme intoxication. These events may deviate from one’s “typical” pattern of use and increase the likelihood of associated problems.

Although many studies have investigated relationships between binge drinking and alcohol problems, the typical binge drinking criteria (i.e., 4 drinks for women, 5 drinks for men in about 2 hours) reflects a BAC level of about .08 (NIAAA, 2004), and as such, these episodes may not encompass the high levels of drinking often observed in college students. Indeed, research on binge drinking suggests that 40% of college students report binge drinking in the last two weeks (Evenden, 1999), but only 9.4% of college student drinkers report an instance of “blacking out” in the last two weeks (White, Jamieson-Drake, & Swartzwelder, 2002). Thus, reported symptoms of extreme intoxication, such as blackouts, getting sick, or having a hangover, may be more fitting indicators of high-level use that deviates from one’s “typical” drinking pattern and may thus increase the likelihood of engaging in risk behavior. As such, the current study addresses a gap in the literature by distinguishing between one’s “typical” alcohol use pattern and symptoms of extreme intoxication.

1.1. Trait Affect, Alcohol Use, and Problems

Affect dysregulation plays a role in alcohol-related problems (cf. Cyders & Smith, 2008; Kassel et al., 2010; Sher & Trull, 1994; Simons, Gaher, Correia, et al., 2005; Smith & Anderson, 2001). For example, those high in trait negative affect may use alcohol at high levels in order to cope with painful feelings, which may, in turn, increase the risk for alcohol-related problems (Cooper, Frone, Russell, & Mudar, 1995; Cox & Klinger, 1988). A growing body of research has demonstrated associations between negative affect and alcohol use, as well as alcohol problems beyond use level (Cooper, Agocha, & Sheldon, 2000; Hussong, Hicks, Levy, & Curran, 2001; Jackson & Sher, 2003; Simons, Gaher, Correia, et al., 2005; Swendsen et al., 2000; Turner, Larimer, Sarason, & Trupin, 2005). Still, many studies have found no support for relationships between trait negative affect and alcohol use or problems (Greeley & Oei, 1999; Hussong et al., 2001; Sayette, 1999). Thus, understanding the mechanisms by which negative affect may contribute to alcohol use and problems remains an important and unresolved area of study.

Individuals high in positive affectivity may also drink at high levels to enhance positive mood, and this may, in turn, be related to more alcohol-related problems (Cooper et al., 2000; McCreary & Sadava, 2000). However, findings have been inconsistent (Pandina, Johnson, & Labouvie, 1993; Simons, Gaher, Correia, et al., 2005) and some report inverse associations between positive affect and alcohol use (Wills, Sandy, Shinar, & Yaeger, 1999). Whereas drinking to cope with negative affect exhibits direct associations with alcohol

problems, drinking for enhancement motives is indirectly associated with problems via alcohol use (Cooper et al., 2000). Given these findings, the most plausible relationship between trait positive affect and alcohol problems may be indirect through increased levels of alcohol use. Such a relationship may be more relevant in samples comprised of individuals who often drink at high levels in jubilant social contexts, such as college students (Glindemann, Wiegand, & Geller, 2007; Neal, Sugarman, Hustad, Caska, & Carey, 2005). Nevertheless, the inconsistent relationships between both positive and negative affectivity and alcohol use suggest that associations may be indirect via more proximal predictors, limited to specific drinking variables, (e.g., use frequency vs. problems), or conditional upon important moderating variables.

1.2. Affect-Based Behavioral Undercontrol: Positive and Negative Urgency

Impulsivity is associated with increased rates of alcohol use and related problems (Neal & Carey, 2007; Sher & Trull, 1994; Simons, Gaher, Oliver, Bush, & Palmer, 2005). Several lines of research indicate impulsivity is a multi-faceted construct (Evenden, 1999; Whiteside & Lynam, 2001). Two aspects of impulsivity, positive and negative urgency, may be particularly relevant to understanding associations between trait affectivity and alcohol outcomes. Positive and negative urgency refer to the tendency to act rashly when experiencing either positive or negative affect, respectively (Cyders et al., 2007; Whiteside & Lynam, 2001). Psychometric studies have shown that both negative urgency (Whiteside & Lynam, 2001) and positive urgency (Cyders & Smith, 2007) load onto a higher-order neuroticism factor. Thus, negative affectivity is positively associated with both negative and positive urgency (Cyders & Smith, 2008; d'Acremont & Van der Linden, 2005; Fischer, Smith, Annus, & Hendricks, 2007; Gonzalez, Reynolds, & Skewes, 2011), suggesting that those who frequently experience uncomfortable emotions may be more likely to act rashly when experiencing emotional extremes of either valence. Few studies have examined relationships between trait positive affectivity and the urgency traits, but research with related constructs (e.g., extraversion, frequency of intense positive mood) indicates that trait positive affectivity may not be associated with urgency (Cyders & Smith, 2008; Settles et al., 2010; Simons et al., 2010). Alternatively, positive affect may promote psychological health, increasing faculties like cognitive flexibility and problem solving (Isen, 1987; Isen, Niedenthal, & Cantor, 1992). In this latter case, positive affect might be related to adaptive behavioral control.

The urgency traits have shown consistent relationships with substance use and related problems (Fischer, Anderson, & Smith, 2004; Fischer & Smith, 2008; Magid & Colder, 2007), and in many cases, positive and negative urgency exhibit direct associations with substance-related problems, commonly over-and-above use (Cyders, Flory, Rainer, & Smith, 2009; Cyders et al., 2007; Fischer et al., 2007; Magid & Colder, 2007; Smith et al., 2007). Cyders and colleagues (2009) proposed that positive urgency may be a particularly important predictor of alcohol use and related problems among college students, since drinking often occurs in celebratory contexts in this population. Indeed, positive urgency is associated with problematic alcohol use and a range of risk behaviors (Cyders & Smith, 2007, 2010; Cyders et al., 2007), including risky sex (Simons, Maisto, & Wray, 2010; Zapolski, Cyders, & Smith, 2009).

Negative urgency also exhibits associations with alcohol problems over and above use level (Cyders et al., 2009; Fischer & Smith, 2008; King, Karyadi, Luk, & Patock-Peckham, 2011), including increased aggression (Lynam & Miller, 2004), unprotected sex (Deckman & DeWall, 2011; Simons, Maisto, et al., 2010), and functional problems (Verdejo-Garcia, Bechara, Recknor, & Perez-Garcia, 2007). However, many of these studies did not include positive urgency, which may change observed relationships. In two models that included both urgency traits, positive, but not negative, urgency was associated with alcohol-related

problems (Cyders et al., 2009) and risk behaviors (Zapolski et al., 2009). Simons and colleagues (2010), however, found that both positive and negative urgency were positively related to risky sex. Cyders and Smith (2008) note that both positive and negative urgency tend to be related more to externalizing expressions of emotionality (as opposed to internalizing), which suggests that both urgency traits may be robust predictors of risk behaviors, such as getting into fights, driving drunk, and risky sex.

The previous review suggests two potential mechanisms by which urgency may be involved in associations between trait affect and alcohol use and problems. First, urgency may mediate associations between trait affect and alcohol use or problems. Gonzalez and colleagues (2011) showed that negative urgency mediated relationships between depressive symptoms and alcohol-related problems. Settles and colleagues (2012) also showed that negative urgency exhibits unique predictive power beyond neuroticism for externalizing alcohol problems. Expected associations between positive affectivity and urgency are less clear, but worthy of further investigation. Etiological models of urgency suggest that both urgency traits may emerge as individuals attempt to regulate and change dysregulated affect (Cyders & Smith, 2008), lending general support for the mediating role of the urgency traits. Second, urgency may moderate associations between affect and risk behavior, increasing the strength of associations. Both global and event-level studies have shown that negative urgency (Cyders & Coskunpinar, 2010; Simons, Dvorak, Batien, & Wray, 2010), as well as general impulsivity (Hussong & Chassin, 1994; Simons, Gaher, Oliver, et al., 2005), strengthened relationships between negative affect and alcohol use and problems. Positive urgency has similarly been shown to potentiate the effects of negative affectivity on alcohol-related problems (Karyadi & King, 2011). Two studies have also found that impulsivity and positive urgency may moderate the relationship between positive affect and alcohol use and problems, such that this association is stronger at low levels of positive affect (Colder & Chassin, 1997; Simons, Maisto, et al., 2010).

Overall, these studies demonstrate that the tendency to engage in reckless behavior when affectively aroused is an important individual difference characteristic in affective models of alcohol use and problems. Urgency may moderate associations between affectivity and alcohol use and problems, thus accounting for the sometimes discrepant findings in the literature on associations between trait affect and substance use. Alternatively, urgency may mediate associations between trait affect and alcohol use and related problems.

1.3. Tolerance of Affect

Distress tolerance refers to the ability to experience and withstand negative emotional states (Simons & Gaher, 2005). Distress tolerance is considered a meta-emotion construct of evaluations and expectations of experiencing negative emotions. Individuals with poor distress tolerance make appraisals of negative emotions as being unacceptable, shameful, unbearable, and requiring avoidance. This cognitive frame may, in part, promote action tendencies to avoid or terminate negative emotional states when negatively aroused. Poor distress tolerance and negative affectivity may thus both contribute to negative urgency. Indeed, Linehan's (1993) biosocial model suggests that the ability to tolerate negative emotion is necessary for the development of adaptive behavioral regulation (Crowell, Beauchaine, & Linehan, 2009). Previous research indicates moderate associations between distress tolerance and urgency (Anestis, Selby, Fink, & Joiner, 2007; Gaher, Hoffman-Wilke, Hunsaker, Simons, & Buchkoski, August, 2011).

Distress tolerance also exhibits associations with substance use and related problems (Buckner, Keough, & Schmidt, 2007; Simons & Gaher, 2005; Zvolensky et al., 2009), commonly over and above depressive symptoms (Buckner et al., 2007; Simons & Gaher, 2005; Simons, Gaher, Oliver, et al., 2005). Moreover, several studies have investigated the

role of distress tolerance as a moderator of relationships between specific forms of affect and substance-related outcomes. In an event-level study, Simons and colleagues (2005) found that distress tolerance moderated the relationship between positive affect and alcohol use, such that at low levels of positive affect, those low in distress tolerance drank more than those high in distress tolerance. In addition, Gorka and colleagues (2012) found that the relationship between symptoms of depression and alcohol-related problems was potentiated at low levels of distress tolerance. Similarly, Anestis and colleagues (2007) reported that the association between distress tolerance and binge/purging symptoms was negative at high levels of urgency. However, there is both theoretical and empirical support for distress tolerance exhibiting indirect associations with problem behaviors via urgency or other forms of behavioral dysregulation (Crowell et al., 2009; Gaher et al., August, 2011). Together, these studies suggest that distress tolerance may moderate associations between affective risk factors and alcohol outcomes and/or exhibit indirect associations with alcohol outcomes via negative urgency.

In summary, negative affect and distress tolerance have exhibited relationships with both alcohol use and problems, but positive affect has primarily been related to problems via use. Studies have supported both the mediating and moderating role of the urgency traits in the relationship between trait affect and substance use outcomes. Evidence has also supported, to varying degrees, direct relationships between both urgency traits and alcohol use and problems.

1.4. The Current Study

The current study tested a model of relationships between trait affectivity, distress tolerance, positive and negative urgency, “typical” alcohol use, blackout drinking, and risk behavior. Based on past findings, we expected that trait negative affect would be positively associated with both negative and positive urgency. We also hypothesized that positive affect would be negatively associated with both urgency constructs. Distress tolerance was expected to have direct inverse associations with negative urgency, but no relationship with positive urgency, given that distress tolerance is presumed to reflect weathering negative emotional states. In addition, based on past studies, we expected that distress tolerance and both positive and negative affect would primarily be related to alcohol use and problems via the urgency traits. In turn, we expected that both urgency traits would exhibit direct relationships with “typical” alcohol use, blackout drinking, and risk behavior. Finally, we examined a number of moderation hypotheses based on associations demonstrated in the literature, forming interactions between negative affectivity and negative urgency, negative affect and positive urgency, positive affectivity and positive urgency, negative affect and distress tolerance, and negative urgency and distress tolerance.

2. Method

2.1. Participants

Participants were 621 college students who were recruited from a state university. Participants were recruited through email, fliers, and newspaper advertisements. Women comprised 66% of the sample. Participants ranged in age from 18 to 25 years ($M = 20.21$, $SD = 1.47$). Ninety-three percent of participants were White, 2% multiracial, 2% Asian, 1% Native American/Alaskan Native, 1% Black, and 1% other or did not respond. Ninety-eight percent were non-Hispanic. These demographic characteristics are similar to those of the university-at-large (Regents Information System, 2006). Two other articles have been published from parts of this dataset (Simons, Dvorak, et al., 2010; Simons, Maisto, et al., 2010).

2.2. Procedure

Participants completed questionnaires online. The study was approved by the institutional review board and all participants provided informed consent prior to participation. To ensure participants' confidentiality, unique codes were generated for each participant during their completion of the questionnaires.

2.3. Measures

2.3.1. Alcohol consumption—was assessed using the *Modified Daily Drinking Questionnaire* (MDDQ; Dimeff, Baer, Kivlahan, & Marlatt, 1999), which asks respondents to use a grid representing the 7 days of the week to indicate their usual daily alcohol consumption for a typical week over the past 6 months. Frequency was the number of drinking days per week, while quantity was the median number of standard drinks (one standard drink = 12 oz. beer, 5 oz. wine, or 1.5 oz. liquor) on drinking days. Number of drinking days per week and median number of drinks per drinking day served as indicators of the latent “typical” alcohol use variable.

2.3.2. Alcohol problems—were assessed using the Young Adult Alcohol Consequences Questionnaire (YAACQ; Read, Kahler, Strong, & Colder, 2006), a 48-item scale with dichotomous indicators of various alcohol-related consequences that may have occurred in the past 6 months. Two subscales were used for the present analysis: Risk behaviors (8 items, $\alpha = .79$, sample item, “I have driven a car when I knew I had too much to drink to drive safely”) and blackout drinking (7 items, $\alpha = .81$, sample item, “I have woken up in an unexpected place after heavy drinking”). Thus, the items of these two scales were used to form the “Blackout Drinking” and “Risk Behaviors” latent variables.

2.3.3. Distress tolerance—was assessed using the Distress Tolerance Scale (DTS; Simons & Gaher, 2005), a 14-item scale that includes four subscales: Tolerance (“I can’t handle feeling distressed or upset”), appraisal (“My feelings of distress or being upset scare me”), absorption (“When I feel distressed or upset, all I can think about is how bad I feel”), and regulation (“I’ll do anything to avoid feeling distressed or upset”). All items were rated on a 5-point scale ranging from (1) strongly agree to (5) strongly disagree. Subscale total scores were used as indicators, with high scores representing more distress tolerance ($\alpha = .91$). Although a number of behavioral assessments of distress tolerance exist, the DTS is a widely used self-report measure that focuses on tolerance for general negative emotion. Bernstein and colleagues (2009) replicated the factor structure of the DTS and showed that it is positively related to anxiety sensitivity but unrelated to a measure of somatic discomfort intolerance. Criterion validity has also been supported by positive associations with related concepts, such as mood acceptance, and negative relationships with coping substance use motives (Howell, Leyro, Hogan, Buckner, & Zvolensky, 2010; Simons & Gaher, 2005).

2.3.4. Positive and negative affectivity—were assessed using the relevant scales of the PANAS-X (Watson & Clark, 1994). Participants were asked to rate each indicator of dimensions of positive affect (10 items; e.g., active, enthusiastic, inspired) and negative affect (10 items; e.g., scared, irritable, upset) according to “the extent [they] have felt this way in general, that is, on average.” All items were rated on a scale from 1 (*very slightly or not at all*) to 5 (*extremely*). Three indicators were formed for both positive (attentiveness, $\alpha = .73$; joviality, $\alpha = .50$; assuredness, $\alpha = .62$) and negative affectivity (fear, $\alpha = .80$; hostility, $\alpha = .59$; sadness, $\alpha = .75$) each based on conceptual relatedness of items (Watson, 1988).

2.3.5. Positive and negative urgency—Positive urgency was assessed using the Positive Urgency Measure (PUMS; Cyders et al., 2007), a 14-item scale that assesses the

propensity for acting rashly when experiencing positive mood ($\alpha = .95$). The measure includes items such as, “When I am in a great mood, I tend to get into situations that could cause me problems,” and “I tend to lose control when I am in a great mood.” Negative urgency was assessed using the relevant 12-item subscale of the UPPS Impulsive Behavior Scale (UPPS; Whiteside & Lynam, 2001). Negative urgency includes items such as, “When I feel upset, I often act without thinking” ($\alpha = .90$). All items are rated on a 4-point scale ranging from 1 (*disagree strongly*) to 4 (*agree strongly*). Similar to other studies examining these traits using like methods (Cyders et al., 2009; Cyders & Smith, 2007; Fischer & Smith, 2008; Smith et al., 2007), three item parcels were formed for both urgency traits using the item-to-construct method (Little, Cunningham, Shahar, & Widaman, 2002). We chose to parcel items in order to reduce the overall number of parameters estimated (given the sample size), minimize error variance attributable to individual items, and avoid problems associated with violations of distributional assumptions of specific items. As such, for negative urgency, parcel one consisted of UPPS items 20, 22, 15, and 14, parcel two consisted of items 18, 13, 23, and 21, and parcel three consisted of 17, 12, 19 16. For positive urgency, parcel one consisted of items 3, 13, 10, 12, and 6, parcel two was items 9, 14, 8, 5, and 11, and parcel three was items 4, 1, 2, and 7.

3. Results

3.1. Descriptive Statistics

Sixty-four participants who reported no alcohol use in the last six months were excluded from the analysis. Twelve additional participants were also excluded because the majority of their data were missing. Thus, the analyzed sample consisted of 545 individuals. Participants reported drinking on 2.23 days ($SD = 1.46$) per week with an average of 5.5 drinks ($SD = 3.50$) per drinking day. On the YAACQ, participants endorsed an average of 3.02 indicators ($SD = 2.29$) of “blackout” drinking and an average of 1.69 risk behaviors ($SD = 1.95$). With respect to specific risk behaviors, 161 (29.5%) participants reported driving drunk, 139 (25.5%) reported a regretted sexual situation, 67 (12.3%) reported unprotected sex, 60 (11%) reported having damaged property, 55 (10.1%) reported getting into a physical fight, and 29 (5.3%) reported injuring someone while under the influence of alcohol in the past 6 months.

3.2. Structural Equation Model

We estimated structural equation models using Mplus 6.1 (Muthén & Muthén, 2010). Data were assumed to be missing at random, but not completely at random (Enders & Bandalos, 2001). Since the risk behavior and blackout drinking latent variables had categorical indicators, we used the robust weighted least squares estimator. First, we estimated a measurement model of negative and positive affectivity, negative and positive urgency, distress tolerance, and the three alcohol variables: “typical” alcohol use, blackout drinking, and risk behavior, $\chi^2(467) = 704.19$, $p < .001$, RMSEA = 0.031 (CI: 0.026 – 0.035), CFI = 0.96, WRMR = 0.94. Upon examining modification indices, two indicators of blackout drinking (“I have had a hangover (headache, sick stomach) the morning after I had been drinking” and “I have felt very sick to my stomach or thrown up after drinking”) were allowed to covary (modification index = 27.78). The revised measurement model fit the data well, $\chi^2(466) = 674.85$, $p < .001$, RMSEA = 0.029 (CI: 0.024 – 0.033), CFI = 0.97, WRMR = 0.90. Standardized factor loadings ranged from 0.53 to 0.95.

Next, we estimated a structural model. Gender, positive and negative affectivity, and distress tolerance were exogenous variables. Effects from trait affect and distress tolerance to the alcohol variables were expected to be indirect through the urgency traits. Thus, direct paths were specified between trait affectivity to both urgency traits and from distress tolerance to

negative urgency. In turn, direct paths were specified from the urgency traits to each alcohol variable. Gender was a covariate with paths to the urgency and alcohol constructs. The disturbance terms for the urgency traits were allowed to covary. With respect to the alcohol variables themselves, we specified blackout drinking as a mediator of the association between “typical” alcohol use and risk behavior. The model fit the data well, $\chi^2(501) = 719.61$, $p < .001$, RMSEA = 0.028 (CI: 0.024 – 0.033), CFI = 0.97, WRMR = 0.94.

Next, we examined modification indices to test if any significant direct effects from the exogenous variables to the alcohol outcomes were omitted. One such path, from positive affectivity to “typical” alcohol use, was added (modification index = 42.34). This change to the overall model resulted in a significant improvement in model fit, $\chi^2(2) = 6.21$, $p = .013$, and fit the data well, $\chi^2(504) = 740.09$, $p < .001$, RMSEA = 0.029 (CI: 0.025 – 0.034), CFI = 0.97, WRMR = 0.99. Next, we pruned non-significant paths from the urgency traits to the alcohol variables. Thus, direct paths from positive urgency to risk behavior ($p = .996$), and positive urgency to blackout drinking ($p = .856$), and from negative urgency to blackout drinking ($p = .187$) were constrained to zero¹.

Once the overall fit of the model was established, moderation hypotheses were examined. Latent variable interactions (negative affectivity X negative urgency, negative affect X positive urgency, positive affect X positive urgency, negative affect X distress tolerance, positive affectivity X distress tolerance, and negative urgency X distress tolerance) were tested in a stepwise, “forward selection” fashion, and corresponding main effects were added for each, with each of these latent variable interactions predicting the alcohol variables. Only the positive affectivity by positive urgency and negative affect by distress tolerance variables were significantly associated with any of the alcohol variables. The positive affectivity by positive urgency interaction significantly predicted blackout drinking ($b = -0.21$, $p = .049$), but was not associated with “typical” alcohol use and risk behavior. Although the negative affectivity by distress tolerance interaction was significantly related to both “typical” alcohol use and blackout drinking when examined on its own, these associations were not significant when the positive affect by positive urgency interaction was included in the model (“typical” alcohol use: $b = 0.13$, $p = .117$; blackout drinking: $b = -0.32$, $p = .113$). Thus, only the positive affect by positive urgency interaction was retained, and only the significant path (i.e., to blackout drinking) was estimated in the final model.

3.2.1. Direct relationships—In the final model (see Figure 1), male gender was positively associated with negative urgency ($b = 0.34$, $p = .041$), positive urgency ($b = 1.41$, $p < .001$), and “typical” alcohol use ($b = 0.61$, $p < .001$) and female gender was associated with blackout drinking ($b = -1.54$, $p < .001$). Negative affectivity was positively associated with both negative urgency and positive urgency. In contrast, positive affectivity was inversely associated with both urgency traits. As hypothesized, distress tolerance was inversely associated with negative urgency. In terms of predictors of the alcohol variables, positive affectivity and positive urgency were directly positively associated with “typical” alcohol use. However, neither main effects of positive affectivity or positive urgency on “blackout drinking” were significant. These results suggest that those higher in positive affect, as well as those high in positive urgency, may drink more often and consume more drinks on these occasions, but associations with the problem outcomes were primarily indirect. In contrast, there was a significant positive, direct relationship between negative urgency and risk behavior. Such a relationship suggests that a tendency toward rash action when experiencing negative affect is associated with more engagement in alcohol-related risk behaviors when controlling for both “typical” alcohol use and blackout drinking. Thus,

¹We elected to constrain these paths after model fit was established in order to create a more parsimonious model and to aid in interpretation. A model with these paths retained resulted in the same conclusions.

individuals high in negative urgency may engage in risk behaviors, such as drunk driving, physical fights, and risky sexual behavior, independent of their normal pattern of drinking and reported occasions of extremely high levels of use.

3.2.2. Indirect relationships—As hypothesized, the effects of trait affectivity and distress tolerance on the alcohol outcomes were primarily indirect via the urgency constructs. For example, negative affectivity was indirectly associated with risk behavior through negative urgency (see Table 3), as well as through negative urgency and the alcohol variables. Similarly, distress tolerance was significantly associated with risk behavior both through negative urgency, as well as through negative urgency and the alcohol variables. The indirect relationship between negative affect and blackout drinking through positive urgency and “typical” alcohol use was marginally significant ($abc = 0.18, p = .053$), but the indirect pathway was not significant when extended to risk behavior.

Positive affectivity exhibited an inverse indirect association with risk behavior via negative urgency. Positive affectivity also exhibited inverse indirect associations via positive urgency to “typical” alcohol use ($ab = -0.03, p = .032$), but associations via positive urgency and “typical” alcohol use to blackout drinking were marginally significant ($abc = -0.07, p = .056$) and the indirect effect to risk behavior through this pathway was not significant. In addition to these inverse associations, positive affectivity had significant positive effects on both blackout drinking ($ab = 0.46, p = .002$) and risk behavior via its associations with typical alcohol use. The net result of this mixture of inverse and positive associations was an overall insignificant total effect of positive affect on risk behavior ($abc = 0.01, p = .873$).

3.2.3. Conditional indirect effects—Several of the above indirect effects varied as a function of levels of positive urgency and positive affect, which interacted to predict blackout drinking (see Table 3). As stated above, the direct paths from both positive affect and positive urgency to blackout drinking were insignificant overall, and the form of the interaction was characterized by a cross-over pattern, as depicted in Figure 2. Thus, the conditional indirect effects of positive affect tended to oppose each other, contributing to an insignificant main effect. For example, at 1 *SD* above the positive urgency mean, there was a marginally significant inverse effect from positive affect to blackout drinking to risk behavior, whereas at -1 *SD* there was a non-significant positive effect. This suggests that positive urgency moderated the indirect relationship between positive affectivity and risk behavior, such that, among those high in positive urgency, low levels of positive affect were associated with more blackout symptoms, which, in turn, increased the likelihood of engaging in risk behavior.

Indirect effects from positive affectivity to risk behavior through positive urgency, “typical” alcohol use, and blackout drinking were also conditional upon level of positive affect (due to the positive affect $\times$ positive urgency interaction predicting blackout drinking). However, the indirect effect was only significant at very low levels of positive affect. At 2 *SD* below the positive affect mean, the indirect effect was significant ($abc = -0.21, p = .018$) and at positive affect $M + 2SD$, the indirect effect did not differ from zero ($abc = 0.05, p = .161$).

4. Discussion

The purpose of this study was to test a model of associations between trait affectivity and distress tolerance and three alcohol outcomes in college students: “typical” alcohol consumption, high intensity or “blackout” drinking, and risk behavior (e.g., drunk driving, physical fights, property damage, risky sex). The effects of trait affectivity and distress tolerance were hypothesized to be indirect via urgency. We also examined several theoretically-based moderation effects to test conditional relationships. A related aim of this

study was to determine whether observed increases in risk behavior might be accounted for by high intensity drinking episodes, rather than a unique association between behavioral or affective dysregulation and problem behavior independent of level of alcohol consumption. In general, there was strong support for the mediation hypotheses, but little evidence of moderation effects. Findings are discussed in detail below.

4.1. Indirect effects via urgency

Negative affectivity exhibited positive associations with both negative and positive urgency. This is consistent with previous research indicating that the urgency traits load on a higher-order neuroticism factor (Cyders & Smith, 2007; Whiteside & Lynam, 2001). Individuals who experience greater negative affect tend to have difficulty inhibiting behavior when in both negative and positive emotional states (Cyders & Smith, 2008; d'Acremont & Van der Linden, 2005; Fischer et al., 2007). Distress tolerance, in contrast, was associated with lower negative urgency but was unrelated to positive urgency. The differential associations between distress tolerance and negative affectivity with the urgency traits lend support for the construct validity of the DTS. Whereas negative affectivity is broadly associated with disrupted behavioral control manifested in both positive and negative urgency, distress tolerance refers specifically to weathering *negative* emotional states. This finding is consistent with previous research demonstrating relationships between distress tolerance and urgency (Anestis et al., 2007; Gaher et al., August, 2011)

Trait positive affect, on the other hand, was negatively related to both negative and positive urgency. This finding is novel, as previous research has not examined associations between urgency and a well-established measure of positive affectivity. These relationships suggest that trait positive affect, as an aspect of well-being, may be related to appropriate behavioral control. This is consistent with results showing positive affect restoring appropriate self-control after self-control resources have been depleted (Tice et al., 2007).

Relative to trait affect and distress tolerance, positive and negative urgency acted as more proximal predictors of the alcohol outcomes. Both urgency constructs predicted higher typical use levels and via this association, greater blackout drinking and risk behaviors. In addition, negative urgency exhibited a direct association with risk behavior. For negative affectivity and distress tolerance, associations with the alcohol outcomes were entirely indirect via urgency. Those prone to negative emotions and those less able to tolerate negative emotions were less able to regulate behavior when emotionally aroused.

Theoretical models of associations between negative affect and alcohol use among young adults often focus on self-medication. For example, coping motives are a proximal predictor of alcohol use and assess the extent to which individuals drink to alleviate feelings of depression or anxiety (Cooper et al., 1995; Cooper, Russell, Skinner, Frone, & Mudar, 1992; Cox & Klinger, 1988). Though not explicit, these models suggest a fairly deliberate process whereby individuals experience negative moods and choose to drink alcohol with the hope of feeling better. The present results suggest that, although individuals who experience greater negative affect and have poor tolerance for negative emotions may drink more and experience more problems, this may be due to associated deficits in behavioral control rather than frequency of attempts to self-medicate. Indeed, distress tolerance and trait affectivity did not exhibit significant bivariate associations with typical alcohol use, a measure of frequency and typical consumption amount.

Positive affectivity exhibited inverse indirect associations with the alcohol outcomes via the urgency traits. This is consistent with observed inverse relationships between well-being and alcohol use (Graham & Schmidt, 1999). In addition, however, there was a positive direct association between positive affect and typical alcohol consumption. Associations between

positive affectivity and sociability (Burger & Caldwell, 2000) may account for this effect in college students, where drinking is a common opportunity for socialization and is often used in celebration (Del Boca, Darkes, Greenbaum, & Goldman, 2004; Glindemann et al., 2007; Neal et al., 2005). However, this effect should be interpreted in light of the insignificant bivariate effects between positive affect and the alcohol outcomes, and the insignificant total effect of positive affect in the model. Positive affect is associated with the constructs in the model in complex, and often opposing, directions. Such effects may contribute to disparate findings in the literature (Cooper et al., 2000; McCreary & Sadava, 2000; Pandina et al., 1993; Simons, Gaher, Correia, et al., 2005).

4.2. Typical alcohol use, blackout drinking, and risk behaviors

A primary goal was to improve understanding of associations between affect, behavioral dysregulation and alcohol-related risk behaviors. Several studies have indicated that affective and behavioral dysregulation is associated with increased alcohol-related negative consequences, over and above alcohol use level (Magid et al., 2008; Simons et al., 2009; Simons, Gaher, Correia, et al., 2005). These findings suggest a specific association between self-regulation and the likelihood of negative consequences from drinking. However, such results could be accounted for by dynamics of drinking behavior not captured by the typical frequency and quantity-type measure. That is, *atypical* drinking behavior, reflected by indicators extremely high intoxication (e.g., blacking out, getting sick), may be a more immediate predictor of alcohol-related risk behaviors than typical drinking patterns. Observed relationships between dysregulation and risk behaviors may be accounted for by associations with these drinking patterns.

Importantly, we found that markers of “blacking out” mediated the relationship between “typical” alcohol use and risk behavior. This indirect relationship suggests that the increased likelihood of engaging in risk behavior among individuals who drink more is, in part, due to the increased likelihood of drinking at such extreme levels on some of these occasions as to induce memory loss, sickness, and hangovers. Presumably, these markers are also indicative of losing control over one’s behavior as a result of such extreme levels of alcohol use, which leads to increased involvement in risk behavior. However, although blackout drinking accounted for associations between typical drinking and risk behaviors, it did not fully account for the increased liability of individuals with dysregulated affect. Negative urgency exhibited a direct association with risk behavior, and poor distress tolerance and negative affectivity were associated with increased risk behaviors via this association. Negative affect and the inability to tolerate negative emotions are related to deficits in controlling behavior and increased involvement in behaviours with potential negative consequences, including risk behavior. Although a variety of self-report measures of distress and discomfort tolerance have exhibited relationship with use of various substances and related problems (Buckner et al., 2007; Howell et al., 2010; Perkins, Karelitz, Giedgowd, Conklin, & Sayette, 2010), this finding suggests that negative urgency may serve as a immediate predictor of such outcomes than negative affect and distress tolerance.

In contrast, associations between positive urgency and risk behavior were indirect via increased alcohol consumption. These findings are somewhat contrary to those described by Cyders and colleagues (2009) suggesting that, among all of the UPPS-P traits, positive urgency may be the most relevant predictor of alcohol-related problems. Our results are consistent with a number of prior studies reporting associations between negative urgency and a variety of risk behaviors, including violence (Lynam & Miller, 2004) and unprotected sex (Simons, Maisto, et al., 2010). Given the wide variety of measures, items, and designs used in examining relationships between the urgency traits and alcohol use and problems, patterns in these findings are difficult to elucidate. However, one possible explanation might be that negative and positive urgency are differentially related to distinct *types* of alcohol-

related outcomes in different samples. Specifically, positive urgency may be related to use and problems indicative of high intoxication, such as blackouts and hangovers (Cyders et al., 2009; Cyders et al., 2010). Positive urgency, by definition, may also be more closely related to behaviors that are outgrowths of positive arousal, such as sexual behavior. In contrast, negative urgency may be connected to negative consequences indicative of negative arousal, such as injuring someone else, getting into physical fights, and damaging property. We did not examine this issue specifically, as our measure included a variety of outcomes, but this may be an interesting avenue for future research.

4.3. Moderation effects

We tested several theoretically-based moderation effects. However, only the interaction between positive affect and positive urgency predicting blackout drinking was significant in the final model. This interaction indicated that positive affect was inversely associated with blackout drinking only among individuals who were very high in positive urgency. This pattern of results were similar to those described in past studies (Colder & Chassin, 1997) suggesting that low positive affect, combined with high levels of positive urgency, increases the risk for more blackout events. That is, those who rarely experience positive emotions drink infrequently, but drink at especially hazardous levels when they do, especially among those prone to act rashly when positively aroused. This pattern, then, may lead to increased involvement in risk behavior as a result of less frequent, but extremely high-volume use. Such a finding is important, and points to increased acting out when “feeling good,” especially when such positive feelings are a relatively rare experience. Previous research has supported other moderation effects, such as negative urgency increasing associations between negative affect and alcohol use, risk taking, and other alcohol-related problems (Cyders & Coskunpinar, 2010; Simons, Dvorak, et al., 2010). Similarly, good tolerance for emotional distress may attenuate associations between depression and drinking (Gorka, Ali, & Daughters, 2011). In the current study, we utilized latent variable interactions, and they were tested in a relatively complex multivariate model. Interaction effects are often difficult to detect and future research may provide additional tests of these effects given their theoretical relevance. However, with the current methods available and in the current sample, the pattern of relationships was best characterized by the hypothesized moderation relationships.

4.4. Limitations

Several limitations of the current study should be noted. First, this study was cross-sectional and causal relationships cannot be determined. However, there is considerable evidence that affective and behavioral dysregulation precede problematic alcohol use (Chassin & Ritter, 2001; Zucker, Donovan, Masten, Mattson, & Moss, 2008). Second, observed results may be due to common method variance due to the reliance on self-report scales (McHugh et al., 2011; Reynolds, Ortengren, Richards, & De Wit, 2006; Reynolds, Penfold, & Patak, 2008). Several valid behavioral measures of affectivity, distress tolerance, and impulsivity exist and future research should be devoted to investigating these relationships with additional methods and measures. Third, some indicators demonstrated especially low reliability, namely the “joviality” and “assuredness” indicators for positive affect and “hostility” for negative affect. This is likely a consequence of the low number of items included in these indicators, but poor indicator reliability can nevertheless lead to inaccurate results that typically involve underestimating effects (Kline, 2005). Fourth, the current sample focused on college students and consisted largely of white participants. As such, results should be generalized to other populations with caution. Finally, this model was focused specifically on alcohol use and related problems, and as such, may be limited in its application to other substance use. Future research should examine these relationships with respect to other drug use and related problems.

Overall, the current study identified a number of pathways by which affect regulation is associated with a higher likelihood of engaging in harmful behavior. Behavioral control when emotionally aroused was associated with trait affectivity. Similarly, individuals unable to tolerate negative emotions may be acting hastily to modulate the aversive feeling in some way. The tendency to act rashly when experiencing negative emotions appears to put individuals directly at-risk for engaging in reckless behavior that may be problematic for themselves and the public, including drunk driving, fights and assaults, injuries, and risky sex. Extreme intoxication, and presumably losing control over one's behavior as a result of alcohol use, was a proximal predictor of risk behavior, mediating associations between typical drinking level and risk behaviors. Typical frequency and quantity of drinking may increase the likelihood of negative consequences to the extent that they increase the likelihood of discrete episodes of excessive drinking. However, dysregulated behavior associated with negative affect remains a predictor of risk behavior over and above these high intensity drinking episodes. Overall, this pattern of findings suggests that, among college students, interventions to reduce alcohol-involved harmful behavior could focus on teaching protective behavioral strategies for controlling drinking, particularly when they are celebrating or are otherwise experiencing positive affect. However, for those prone to rash action when experiencing negative affect, interventions to reduce risk behavior may instead focus on developing emotion regulation skills.

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References

- Anestis MD, Selby EA, Fink EL, Joiner TE. The multifaceted role of distress tolerance in dysregulated eating behaviors. *International Journal of Eating Disorders*. 2007; 40(8):718–726. [PubMed: 17868125]
- Bernstein A, Zvolensky MJ, Vujanovic AA, Moos RH. Integrating anxiety sensitivity, distress tolerance, and discomfort intolerance: A hierarchical model of affect sensitivity and tolerance. *Behavior Therapy*. 2009; 40:291–301. [PubMed: 19647530]
- Buckner JD, Keough ME, Schmidt NB. Problematic alcohol and cannabis use among young adults: The roles of depression and discomfort and distress tolerance. *Addictive Behaviors*. 2007; 32:1957–1963. [PubMed: 17258398]
- Burger JM, Caldwell DF. Personality, social activities, job-search behavior and interview success: Distinguishing between PANAS trait positive affect and NEO Extraversion. *Motivation and Emotion*. 2000; 24(1):51–62.
- Chassin, L.; Ritter, J. Vulnerability to substance use disorders in childhood and adolescence. In: Ingram, R.; Price, J., editors. *Vulnerability to Psychopathology: Risk across the lifespan*. New York: Guilford Press; 2001. p. 107-134.
- Colder CR, Chassin L. Affectivity and impulsivity: Temperament risk for adolescent alcohol involvement. *Psychology of Addictive Behaviors*. 1997; 11(2):83–97.
- Cooper ML, Agocha VB, Sheldon MS. A motivational perspective on risky behaviors: The role of personality and affect regulatory processes. *Journal of Personality*. 2000; 68(6):1059–1088. [PubMed: 11130732]
- Cooper ML, Frone MR, Russell M, Mudar P. Drinking to regulate positive and negative emotions: A motivational model of alcohol use. *Journal of Personality and Social Psychology*. 1995; 69:990–1005. [PubMed: 7473043]

- Cooper ML, Russell M, Skinner JB, Frone MR, Mudar P. Stress and alcohol use: Moderating effects of gender, coping, and alcohol expectancies. *Journal of Abnormal Psychology*. 1992; 101:139–152. [PubMed: 1537960]
- Cox W, Klinger E. A motivational model of alcohol use. *Journal of Abnormal Psychology*. 1988; 97:168–180. [PubMed: 3290306]
- Crowell SE, Beauchaine TP, Linehan M. A biosocial developmental model of borderline personality: Elaborating and extending Linehan's theory. *Psychological Bulletin*. 2009; 135(3):495–510. [PubMed: 19379027]
- Cyders MA, Coskunpinar A. Is urgency emotionality? Separating urgent behaviors from effects of emotional experiences. *Personality and Individual Differences*. 2010; 48:839–844. [PubMed: 20514352]
- Cyders MA, Flory K, Rainer S, Smith GT. The role of personality dispositions to risky behavior in predicting first-year college drinking. *Addiction*. 2009; 104(2):193–202. [PubMed: 19149813]
- Cyders MA, Smith GT. Mood-based rash action and its components: Positive and negative urgency. *Personality and Individual Differences*. 2007; 43(4):839–850.
- Cyders MA, Smith GT. Emotion-based dispositions to rash action: Positive and negative urgency. *Psychological Bulletin*. 2008; 134(6):807–828. [PubMed: 18954158]
- Cyders MA, Smith GT. Longitudinal validation of the urgency traits over the first year of college. *Journal of Personality Assessment*. 2010; 92(1):63–69. [PubMed: 20013457]
- Cyders MA, Smith GT, Spillane NS, Fischer S, Annus AM, Peterson C. Integration of impulsivity and positive mood to predict risky behavior: Development and validation of a measure of positive urgency. *Psychological Assessment*. 2007; 19(1):107–118. [PubMed: 17371126]
- Cyders MA, Zapski TCB, Combs JL, Settles RF, Fillmore MT, Smith GT. Experimental effect of positive urgency on negative outcomes from risk taking and on increased alcohol consumption. *Psychology of Addictive Behaviors*. 2010; 24(3):367–375. [PubMed: 20853921]
- d'Acremont M, Van der Linden M. Adolescent impulsivity: Findings from a community sample. *Journal of Youth and Adolescence*. 2005; 34(5):427–435.
- Deckman T, DeWall CN. Negative urgency and risky sexual behaviors: A clarification of the relationship between impulsivity and risky sexual behavior. *Personality and Individual Differences*. 2011; 51:674–678.
- Del Boca FK, Darkes J, Greenbaum PE, Goldman MS. Up close and personal: Temporal variability in the drinking of individual college students during their first year. *Journal of Consulting and Clinical Psychology*. 2004; 72:155–164. [PubMed: 15065951]
- Dimeff, LA.; Baer, JS.; Kivlahan, DR.; Marlatt, GA. Brief alcohol screening and intervention for college students (BASICS): A harm reduction approach. New York, NY: Guilford Press; 1999.
- Enders CK, Bandalos DL. The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling*. 2001; 8:430–457.
- Evenden JL. Varieties of impulsivity. *Psychopharmacology*. 1999; 146(4):348–361. [PubMed: 10550486]
- Fischer S, Anderson KG, Smith GT. Coping With Distress by Eating or Drinking: Role of Trait Urgency and Expectancies. *Psychology of Addictive Behaviors*. 2004; 18(3):269–274. [PubMed: 15482082]
- Fischer S, Smith GT. Binge eating, problem drinking, and pathological gambling: Linking behavior to shared traits and social learning. *Personality and Individual Differences*. 2008; 44(4):789–800.
- Fischer S, Smith GT, Annus A, Hendricks M. The relationship of neuroticism and urgency to negative consequences of alcohol use in women with bulimic symptoms. *Personality and Individual Differences*. 2007; 43(5):1199–1209.
- Gaher RM, Hoffman-Wilke N, Hunsaker R, Simons JS, Buchkoski J. Emotion regulation deficits as mediators between traumatic stress and borderline symptoms. 2011 Aug.
- Glindemann KE, Wiegand DM, Geller ES. Celebratory drinking and intoxication: A contextual influence on alcohol consumption. *Environment and Behavior*. 2007; 39(3):352–366.

- Gonzalez VM, Reynolds B, Skewes MC. Role of impulsivity in the relationship between depression and alcohol problems among emerging adult college drinkers. *Experimental and Clinical Psychopharmacology*. 2011; 19(4):303–313. [PubMed: 21480733]
- Gorka SM, Ali B, Daughters SB. The role of distress tolerance in the relationship between depressive symptoms and problematic alcohol use. *Psychology of Addictive Behaviors*. 2011 Advance online publication.
- Graham K, Schmidt G. Alcohol use and psychosocial well-being among older adults. *Journal of Studies on Alcohol and Drugs*. 1999; 60(3):345–351.
- Greeley, J.; Oei, T. Alcohol and tension reduction. In: Leonard, KE.; Blane, HT., editors. *Psychological theories of drinking and alcoholism*. 2nd ed.. New York: Guilford Press; 1999. p. 14-53.
- Hingson R, Heeren T, Winter M, Wechsler H. Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18–24: Changes from 1998 to 2001. *Annual Review of Public Health*. 2005; 26:259–279.
- Howell AN, Leyro TM, Hogan J, Buckner JD, Zvolensky MJ. Anxiety sensitivity, distress tolerance, and discomfort intolerance in relation to coping and conformity motive for alcohol use and alcohol use problems among young adult drinkers. *Addictive Behaviors*. 2010; 35:1144–1147. [PubMed: 20719435]
- Hussong AM, Chassin L. The stress-negative affect model of adolescent alcohol use: Disaggregating negative affect. *Journal of Studies on Alcohol*. 1994; 55(6):707–718. [PubMed: 7861800]
- Hussong AM, Hicks RE, Levy SA, Curran PJ. Specifying the relations between affect and heavy alcohol use among young adults. *Journal of Abnormal Psychology*. 2001; 110:449–461. [PubMed: 11502088]
- Isen AM. Positive affect, cognitive processes, and social behavior. *Advances in Experimental Social Psychology*. 1987; 20:203–253.
- Isen AM, Niedenthal PM, Cantor N. An influence of positive affect on social categorization. *Motivation and Emotion*. 1992; 16:65–78.
- Jackson KM, Sher KJ. Alcohol use disorders and psychological distress: A prospective state-trait analysis. *Journal of Abnormal Psychology*. 2003; 112(4):599–613. [PubMed: 14674872]
- Karyadi KA, King KM. Urgency and negative emotions: Evidence for moderation on negative alcohol consequences. *Personality and Individual Differences*. 2011; 51(5):635–640.
- Kassel, JD.; Wardle, MC.; Heinz, AJ.; Greenstein, JE. Cognitive theories of drug effects on emotion. In: Kassel, JD., editor. *Substance Abuse and Emotion*. Washington, DC: American Psychological Association; 2010. p. 61-82.
- King KM, Karyadi KA, Luk JW, Patock-Peckham JA. Dispositions to rash action moderate the associations between concurrent drinking, depressive symptoms, and alcohol problems during emerging adulthood. *Psychology of Addictive Behaviors*. 2011; 25(3):446–454. [PubMed: 21553946]
- Kline, RB. *Principles and practice of structural equation modeling*. 2nd ed.. New York: Guilford Press; 2005.
- Linehan, M. *Cognitive-behavioral treatment of borderline personality disorder*. New York: Guilford Press; 1993.
- Little TD, Cunningham WA, Shahar G, Widaman KF. To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling*. 2002; 9(2):151–173.
- Lynam DR, Miller JD. Personality Pathways to Impulsive Behavior and Their Relations to Deviance: Results from Three Samples. *Journal of Quantitative Criminology*. 2004; 20(4):319–341.
- Magid V, Colder CR. The UPPS Impulsive Behavior Scale: Factor structure and associations with college drinking. *Personality and Individual Differences*. 2007; 43(7):1927–1937.
- Magid V, MacLean MG, Colder CR. Differentiating between sensation seeking and impulsivity through their mediated relationships with alcohol use and problems. *Addictive Behaviors*. 2008; 32(10):2046–2061. [PubMed: 17331658]
- McCreary DR, Sadava SW. Stress, alcohol use and alcohol-related problems: The influence of negative and positive affect in two cohorts of young adults. *Journal of Studies on Alcohol*. 2000; 61(3):466–474. [PubMed: 10807221]

- McHugh KR, Daughters SB, Lejuez CW, Murray HW, Hearon BA, Gorka SM, Otto MW. Shared variance among self-report and behavioral measures of distress tolerance. *Cognitive Therapy and Research*. 2011; 35:266–275.
- Muthén, LK.; Muthén, BO. *Mplus user's guide*. 6th ed.. Los Angeles: Author; 2010.
- National Institute on Alcohol Abuse and Alcoholism. Bethesda, MD: Author; 2004. NIAAA Council Approves Definition of Binge Drinking, NIAAA Newsletter No. 3.
- Neal DJ, Carey KB. Association between alcohol intoxication and alcohol-related problems: An event-level analysis. *Psychology of Addictive Behaviors*. 2007; 21(2):194–204. [PubMed: 17563139]
- Neal DJ, Sugarman DE, Hustad JT, Caska CM, Carey KB. It's all fun and games...or is it? Collegiate sporting events and celebratory drinking. *Journal of Studies on Alcohol*. 2005; 66:291–294. [PubMed: 15957681]
- Pandina, R.J.; Johnson, V.; Labouvie, EW. Affectivity: A central mechanism in the development of drug dependence. In: Glantz, M.; Pickens, R., editors. *Vulnerability to drug abuse*. Washington, DC: American Psychological Association; 1993. p. 179-209.
- Perkins KA, Karelitz JL, Giedgowd GE, Conklin CA, Sayette MA. Differences in negative mood-induced smoking reinforcement due to distress tolerance, anxiety sensitivity, and depression history. *Psychopharmacology*. 2010; 210:25–34. [PubMed: 20217051]
- Read JP, Kahler CW, Strong DR, Colder CR. Development and Preliminary Validation of the Young Adult Alcohol Consequences Questionnaire. *Journal of Studies on Alcohol*. 2006; 67(1):169–177. [PubMed: 16536141]
- Reynolds B, Ortengren A, Richards JB, De Wit H. Dimensions of impulsive behavior: Personality and behavioral measures. *Personality and Individual Differences*. 2006; 40:305–315.
- Reynolds B, Penfold RB, Patak M. Dimensions of impulsive behavior in adolescents: Laboratory behavioral assessments. *Experimental and Clinical Psychopharmacology*. 2008; 16(2):124–131. [PubMed: 18489016]
- Sayette MA. Does drinking reduce stress? *Alcohol Research & Health*. 1999; 23(4):250–255. [PubMed: 10890821]
- Settles RF, Fischer S, Cyders MA, Combs JL, Gunn RL, Smith GT. Negative urgency: A personality predictor of externalizing behavior characterized by neuroticism, low conscientiousness, and disagreeableness. *Journal of Abnormal Psychology*. 2012; 121(1):160–172. [PubMed: 21859164]
- Sher KJ, Trull TJ. Personality and disinhibitory psychopathology: Alcoholism and antisocial personality disorder. *Journal of Abnormal Psychology*. 1994; 103(1):92–102. [PubMed: 8040486]
- Simons JS, Carey KB, Wills TA. Alcohol abuse and dependence symptoms: A multidimensional model of common and specific etiology. *Psychology of Addictive Behaviors*. 2009; 23(3):415–427. [PubMed: 19769426]
- Simons JS, Dvorak RD, Batien BD, Wray TB. Event-level associations between affect, alcohol intoxication, and acute dependence symptoms: Effects of urgency, self-control, and drinking experience. *Addictive Behaviors*. 2010; 35(12):1045–1053. [PubMed: 20685044]
- Simons JS, Gaher RM. The Distress Tolerance Scale: Development and validation of a self-report measure. *Motivation and Emotion*. 2005; 29(2):83–102.
- Simons JS, Gaher RM, Correia CJ, Hansen CL, Christopher MS. An affective-motivational model of marijuana and alcohol problems among college students. *Psychology of Addictive Behaviors*. 2005; 19(3):326–334. [PubMed: 16187813]
- Simons JS, Gaher RM, Oliver MNI, Bush JA, Palmer MA. An experience sampling study of associations between affect and alcohol use and problems among college students. *Journal of Studies on Alcohol*. 2005; 66(4):459–469. [PubMed: 16240553]
- Simons JS, Maisto SA, Wray TB. Sexual risk taking among young adult dual alcohol and marijuana users. *Addictive Behaviors*. 2010; 35(5):533–536. [PubMed: 20071102]
- Smith, GT.; Anderson, KG. Personality and learning factors combine to create risk for adolescent problem drinking: A model and suggestions for intervention. In: Monti, PM.; Colby, SM.; O'Leary, TA., editors. *Adolescents, alcohol, and substance abuse: Reaching teens through brief interventions*. New York, NY US: Guilford Press; 2001. p. 109-141.

- Smith GT, Fischer S, Cyders MA, Annus AM, Spillane NS, McCarthy DM. On the validity and utility of discriminating among impulsivity-like traits. *Assessment*. 2007; 14(2):155–170. [PubMed: 17504888]
- Swendsen JD, Tennen H, Carney MA, Affleck G, Willard A, Hromi A. Mood and alcohol consumption: An experience sampling test of the self-medication hypothesis. *Journal of Abnormal Psychology*. 2000; 109:198–204. [PubMed: 10895557]
- Turner AP, Larimer ME, Sarason IG, Trupin EW. Identifying a negative mood subtype in incarcerated adolescents: Relationship to substance use. *Addictive Behaviors*. 2005; 30(7):1442–1448. [PubMed: 16022939]
- Verdejo-Garcia A, Bechara A, Recknor EC, Perez-Garcia M. Negative emotion-driven impulsivity predicts substance dependence problems. *Drug and Alcohol Dependence*. 2007; 91(2):213–219. [PubMed: 17629632]
- Watson D. The vicissitudes of mood measurement: Effects of varying descriptors, time frames, and response formats on measures of Positive and Negative Affect. *Journal of Personality and Social Psychology*. 1988; 55:128–141. [PubMed: 3418487]
- Watson, D.; Clark, LA. Manual for the positive and negative affect schedule: Expanded form. Iowa City, IA: University of Iowa; 1994.
- Whiteside SP, Lynam DR. The Five Factor Model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences*. 2001; 30(4):669–689.
- Wills TA, Sandy JM, Shinar O, Yaeger A. Contributions of positive affect and negative affect to adolescent substance use: Test of a bidimensional model in a longitudinal study. *Psychology of Addictive Behaviors*. 1999; 13(4):327–338.
- Zapolski TCB, Cyders MA, Smith GT. Positive urgency predicts illegal drug use and risky sexual behavior. *Psychology of Addictive Behaviors*. 2009; 23(2):348–354. [PubMed: 19586152]
- Zucker RA, Donovan JE, Masten AS, Mattson ME, Moss HB. Early developmental processes and the continuity of risk for underage drinking and problem drinking. *Pediatrics*. 2008; 121(Suppl4):S252–S272. [PubMed: 18381493]
- Zvolensky MJ, Marshall EC, Johnson K, Hogan J, Bernstein A, Bonn-Miller MO. Relations between anxiety sensitivity, distress tolerance and fear reactivity to bodily sensations to bodily sensations to coping and conformity marijuana use motives among young adult marijuana users. *Experimental and Clinical Psychopharmacology*. 2009; 17(1):31–42. [PubMed: 19186932]

HIGHLIGHTS

- Study of affect and behavior dysregulation on patterns of alcohol use and risk behavior
- Negative affect promotes risk behavior directly via behavior dysregulation
- Positive affect is indirectly related to risk through increased alcohol use
- Affect-based behavior dysregulation were proximal predictors of alcohol problems

Figure 1. Structural model for the full sample ($N = 545$). All values are unstandardized coefficients. Dashed lines indicate non-significant paths. Gender is omitted for clarity. All exogenous variables, as well as positive and negative urgency, were allowed to covary. † $p < .05$, * $p < .01$, ** $p < .001$.

Figure 2.
Direct effects of positive affectivity on blackout drinking as a function of levels of positive urgency.

Table 1

Descriptive Statistics

Variables	Mean	SD	Skew	Range
Gender	--	--	--	353W/192M
Negative affect (Hostility)	2.00	0.81	0.84	1 – 5
Negative affect (Sadness)	2.07	0.77	0.76	1 – 4.75
Negative affect (Fear)	2.07	0.85	0.97	1 – 5
Positive affect (Self-assurance)	3.26	0.96	−0.28	1 – 5
Positive affect (Attentiveness)	3.37	0.76	−0.54	1 – 5
Positive affect (Joviality)	3.46	0.81	−0.57	1 – 5
Distress tolerance (Tolerance)	3.38	0.96	−0.20	1 – 5
Distress tolerance (Absorption)	3.54	1.04	−0.36	1 – 5
Distress tolerance (Re-appraisal)	3.70	0.83	−0.49	1 – 5
Distress tolerance (Regulation)	3.45	0.93	−0.06	1 – 5
Negative urgency 1	8.66	2.50	0.23	4 – 16
Negative urgency 2	9.16	2.85	0.13	4 – 16
Negative urgency 3	8.34	2.78	0.30	4 – 16
Positive urgency 1	8.35	3.12	1.15	5 – 20
Positive urgency 2	8.04	3.15	1.18	5 – 20
Positive urgency 3	6.64	2.78	1.15	4 – 16
Drinking days per week	2.23	1.46	0.90	0 – 7
Median drinks per drinking day	4.94	3.93	1.20	0 – 25
Blackout drinking total	3.02	2.29	0.28	0 – 7
Risk behavior total	1.69	1.95	1.14	0 – 8

Note. N = 545.

Table 2

Correlations Among Latent Constructs

Variables	1	2	3	4	5	6	7	8
1. Gender								
2. Distress tolerance	0.05							
3. Negative affectivity	-0.08	-0.48*						
4. Positive affectivity	-0.01	0.30*	-0.15*					
5. Negative urgency	0.02	-0.52*	0.54*	-0.33*				
6. Positive urgency	0.16*	-0.25*	0.29*	-0.23*	0.56*			
7. "Typical" alcohol use	0.43*	-0.03	0.09	0.10	0.21*	0.31*		
8. Blackout drinking	0.11 [†]	-0.10	0.17*	0.01	0.27*	0.29*	0.85*	
9. Risk behavior	0.20*	-0.19*	0.20*	-0.08	0.40*	0.36*	0.76*	0.84*

Note: N = 545.

[†] *p* < .05.

* *p* < .01.

Table 3

Unstandardized Indirect and Total Effects for Exogenous Variables Predicting Risk Behavior

Variables/Path	<i>b</i>	<i>SE</i>	<i>p</i>
Negative Affect (NA)			
NA → NU → RISK	0.16	.05	.003
NA → NU → ALC → BLK → RISK	0.13	.06	.025
NA → PU → ALC → BLK → RISK	0.10	.06	.091
Total	0.01	.01	.326
Distress Tolerance (DTS)			
DTS → NU → RISK	−0.10	.03	.006
DTS → NU → ALC → BLK → RISK	−0.07	.03	.024
Total	0.01	.01	.139
Positive Affect (PA)			
PA → NU → RISK	−0.04	.02	.015
PA → ALC → BLK → RISK	0.27	.11	.014
PA → PU → ALC → BLK → RISK	−0.04	.03	.086
PA → BLK → RISK	−0.21	.12	.080
	0.04	.10	.714
PA → PU → BLK → RISK	0.03	.03	.273
	−0.02	.02	.270
Total	0.01	.01	.678
	0.01	.01	.764
Negative Urgency (NU)			
NU → ALC → BLK → RISK	0.09	.04	.016
Total	0.01	.01	.080
Positive Urgency (PU)			
PU → BLK → RISK	−0.14	.13	.297
	0.11	.10	.281
PU → ALC → BLK → RISK	0.22	.12	.061
Total	−0.03	.04	.462
	0.02	.02	.290

Note. ALC = “Typical” alcohol use, BLK = Blackout drinking, RISK = Risk behavior. Totals for each exogenous variable include all direct and indirect effects. Values noted in fractions are estimates for +1.*SD* over −1.*SD* of the moderator.