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The Effects of Repetitive Thought and Construal Level on Alcohol Consumption

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The Effects of Repetitive Thought and Construal Level on Alcohol Consumption

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
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Abstract

Repetitive thought, or the recurrent, often cyclical, focus on self-relevant concerns and experiences, is one liability that may be common across internalizing (INT) and externalizing (EXT) disorders. One particular area of interest for examining repetitive thought as a transdiagnostic process is in relation to alcohol use because alcohol abuse and dependence are the most common, and possibly most costly, EXT disorders. This study experimentally induced abstract repetitive thought, concrete repetitive thought, or distraction to test if repetitive thought and construal level have an effect on drinking behavior. It was hypothesized that individuals in both repetitive thought conditions would drink more than those in the distraction condition. Second, it was expected that individuals in the abstract condition would drink more than those in the concrete condition. Neither of these hypotheses was supported. Additionally, to assess for evidence of repetitive thought as a transdiagnostic process, the interaction between repetitive thought and INT was examined. If repetitive thought is truly transdiagnostic, then the relationship between repetitive thought and drinking should be stronger for individuals with more internalizing symptoms. Results did not indicate a significant interaction effect. The lack of findings in this study may be due to an ineffective experimental manipulation. Alternatively, they may suggest that repetitive thought does not have an effect on drinking.

The Effects of Repetitive Thought and Construal Level on Alcohol Consumption

The high level of comorbidity between psychiatric disorders across the diagnostic spectrum has been well established. Approximately 45% of individuals meet diagnostic criteria for two or more disorders over 12 months and the lifetime (Kessler, Berglund, Demler, Jin, & Walters, 2005; Kessler, Chiu, Demler, & Walters, 2005). This pattern of comorbidity holds across a variety of types disorders. For example, panic disorders are highly comorbid with other anxiety (45%-93%) and mood disorders (36%-73%; Kessler et al., 2006a). Additionally, 40% of individuals with antisocial personality disorder have a comorbid alcohol or substance use disorder substance (Lenzenweger, Lane, Loranger, & Kessler, 2007). Finally, individuals with substance use disorders often have comorbid mood (21.6%) and anxiety disorders (19.1%) (Conway, Compton, Stinson, & Grant, 2006). In recognition of this tremendous overlap among disorders in individuals, researchers in the mental health field have begun to shift away from a disorder specific approach. Instead, they are seeking to identify transdiagnostic processes or common liabilities that play a role in the development and maintenance of symptoms across different forms of psychopathology (Harvey, Watkins, Mansell, & Shafran, 2004; Iacono & Tully, in press; Mansell, Harvey, Watkins, & Shafran, 2008; Mansell, Harvey, Watkins, & Shafran, 2009).

In an effort to identify similar disorders that may share common etiological and maintaining factors, researchers have constructed empirical models identifying several higher order factors of mental illness. In particular, Krueger and colleagues (1998) proposed that broad

vulnerabilities of *externalizing* (EXT) and *internalizing* (INT) underlie syndromes that share phenomenological similarities and organize the associations among the disorders. The factor of EXT (consisting of drug and alcohol dependence, antisocial personality disorder, and conduct disorder), sometimes referred to as behavioral disinhibition, is defined as a predisposition for high novelty seeking, impulsivity, and lack of constraint (Sher & Trull, 1994; Iacono, Malone, & McGue, 2008). Alternatively, INT (consisting of major depression, dysthymia, generalized anxiety disorder, agoraphobia, social phobia, simple phobia, and obsessive compulsive disorder) is the propensity to experience distress inwardly, which can be further broken down into the factors of anxious misery and fear (Krueger & Markon, 2006; Watson, 2005). This model has been well-validated across multiple studies (Krueger & Markon, 2011). Several studies also report that both INT and EXT show moderate temporal stability (Hicks et al., 2007; Krueger et al., 1998; Vollebergh et al., 2001) and high heritability (Bornovalova, Hicks, Iacono, & McGue, 2010; Hicks, Krueger, Iacono, McGue, & Patrick, 2004; Kendler, Prescott, Myers, & Neale, 2003).

Although the INT and EXT factors are distinct, they are strongly correlated ($r = .51$) (Krueger, 1999; Krueger & Markon, 2006). Additionally, there is a high rate of comorbidity across the two spectra. For instance, about one quarter of all individuals with major depression meet criteria for a substance use disorder (Kessler et al., 2003). Additionally, more than one in ten individuals with social anxiety also have an alcohol use disorder (Grant et al., 2005). Finally, comorbidity rates of antisocial personality disorders with anxiety disorders and mood disorders are 47.5% and 27.7%, respectively (Lenzenwenger et al., 2007). Of interest then are those processes that confer risk for *both* INT and EXT psychopathology, as these liabilities are transdiagnostic in the broadest sense.

Common liabilities across EXT and INT dimensions

Research has begun to identify processes that fit this conceptualization. The most notable and well-researched example of a process that contributes heavily to both EXT and INT disorders is negative emotionality (see Tully & Iacono, in press for a review). Negative emotionality is constituted by tendencies to experience negative emotions (e.g., sadness and anger), deficits in emotion regulation, and poor responses to stressors (Iacono & Tully, under review). Another process that may be a common liability for both INT and EXT mental disorders is recurrent or repetitive thought.

Repetitive thought is a recurrent, often cyclical, focus on self-relevant concerns and experiences (Harvey et al., 2004; Watkins, 2008). It includes several commonly studied constructs, most notably rumination and worry (Watkins, 2008). Multiple review papers and book chapters have identified repetitive thought as a causal and/or maintaining factor across internalizing disorders (Ehring & Watkins, 2008; Harvey et al., 2004). More recent empirical research has continued to support the conclusions drawn in these reviews. Rumination predicts both anxiety and depression longitudinally over and above baseline symptoms (McLaughlin & Nolen-Hoeksema, 2011). Furthermore, rumination predicts generalized anxiety disorder and obsessive compulsive disorder diagnoses even after controlling for comorbid depression (Watkins, 2009). Importantly, the tendency towards repetitive thought is predictive of a variety of INT disorders (i.e., agoraphobia, social phobia, anxiety, and depression symptoms) above and beyond negative emotionality and neuroticism (Arger, Sánchez, Simonson, & Mezulis, 2012; Broeren, Muris, Bouwmeester, van der Heijden, & Abee, 2011; Mahoney, McEvoy, & Moulds, 2012; Mezulis, Simonson, McCauley, & Stoep, 2011; Muris, Fokke, & Kwik, 2009; Roelofs,

Huibers, Peeters, Arntz, & van Os, 2008; Muris, Roelofs, Rassin, Franken, & Mayer, 2005;).

Clearly, evidence for the incremental predictive utility of repetitive thought's role in INT symptoms is strong.

There is also some research suggesting that repetitive thought influences EXT behaviors and disorders. Experimentally manipulated rumination increases aggression (Denson, Pedersen, Friese, Hahm, & Roberts, 2011; Pedersen et al., 2011). Furthermore, rumination is associated with substance use problems in adolescence, even when controlling for depression (Willem, Bijttebier, Claes, & Raes, 2011). Finally, rumination prospectively predicts alcohol use and drinking status independently of depression and baseline alcohol use (Caselli et al., 2010). Thus, a limited, but consistent, body of evidence suggests that repetitive thought may be a common risk factor that explains comorbidity across the INT and EXT dimensions.

One particular area of interest for examining repetitive thought as a transdiagnostic process is in relation to alcohol use. Alcohol abuse and dependence are the most common forms of EXT disorders, and alcohol consumption, particularly heavy drinking, is associated with very severe economic, social, and health costs (Kessler et al., 2005a; Perkins, 2002; Rehm, 2009). Theories of repetitive thought suggest that individuals who are high in INT symptoms may be especially likely to show an association between repetitive thought and drinking. Individuals who are high in internalizing psychopathology are highly likely to be dysphoric (Tully & Iacono, in press) and engage in negatively valenced repetitive thought (Ehring & Watkins, 2008). As a result of this thought behavior, high internalizing individuals may exacerbate existing negative affect (Thomsen, 2006) and become stuck in a state of cyclical self-focus that does not promote useful problem solving (Yoon & Joormann, 2012). Drinkers often believe that alcohol helps them avoid or suppress thoughts, and reductions in thought avoidance are associated with

decreased drinking (Bowen, Witkiewitz, Dillworth, & Marlatt, 2007). Thus, individuals high in internalizing may use alcohol as a means of avoiding negative affect and cognitions, in addition to divorcing themselves from seemingly unsolvable problems (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008).

Although cross sectional and prospective research suggests that engaging in repetitive thought may increase alcohol use (Caselli et al., 2010; Caselli, Bortolai, Leoni, Rovetto, & Spada, 2008; Ciesla, Dickson, Anderson, & Neal, 2011), experimental research is necessary to infer a causal relationship between repetitive thought and drinking. Certainly, third variables like negative emotionality or pre-existing psychopathology could contribute to both repetitive thought and alcohol consumption. None of these previous studies controlled for negative emotionality, and most only controlled for one form of psychopathology. Thus, it is clear that more strictly controlled studies are necessary to elucidate the association between repetitive thought and alcohol consumption.

Unconstructive and constructive repetitive thought

Despite the myriad associations of repetitive thought with negative outcomes, not all repetitive thought is unconstructive (Watkins, 2008). In fact, repetitive thought can be helpful in acceptance and growth following trauma, anticipatory planning for challenging situations, and uptake of health-promoting behaviors (e.g., smoking cessation, cancer screening, etc.; Watkins, 2008). Watkins (2008) reviewed the evidence for constructive and unconstructive forms of repetitive thought, and concluded that unconstructive repetitive thought is typically negatively (as opposed to positively) valenced, occurs in a negative intrapersonal state (e.g., in a state of dysphoria or low self-esteem as opposed to a state of euphoria or high self esteem), and is construed at an abstract (as opposed to concrete) level.

There is a wealth of evidence to support the first two claims. Repetitive thought that is focused on distress (i.e., is negatively valenced) is consistently related to both INT (e.g., depression and anxiety) and EXT (e.g., harmful drinking), whereas neutral or positively valenced thought is often unrelated to depression and positively associated with positive affect and increased well-being (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Segerstrom, Stanton, Alden, & Shortridge, 2003). Similarly, experimentally induced repetitive thought seems to only have detrimental effects for individuals in a negative intrapersonal state, such as dysphoria (Nolen-Hoeksema, 2004). However, evidence for the abstract-concrete distinction in repetitive thought is considerably more limited.

Abstract thoughts focus on why actions or feelings are experienced and lean on global and dispositional explanations (Watkins, 2008). Conversely, concrete thoughts focus on how actions and feelings occurred and lean on specific, contextual explanations for events (Watkins, 2008). Compared with concrete repetitive thought, abstract repetitive thought is associated with increased overgeneral memory, reduced social problem solving, and more negative self-judgments in depressed individuals (Rimes & Watkins, 2005; Watkins & Moulds, 2005; Watkins & Teasdale, 2001). Beyond its effects on depressed individuals, abstract repetitive thought leads to more persistent negative affect following distress and more intrusive memories about stressful life events than does concrete repetitive thought (Ehring, Szeimies, & Schaffrick, 2009; Santa Maria, Reichert, Hummel, & Ehring, 2012). Thus, the few extant studies on the abstract-concrete distinction in repetitive thought suggest that abstract repetitive thought is generally less adaptive than concrete repetitive thought, but only with regard to INT symptoms.

Indeed, the relationship between abstract and concrete forms of repetitive thought and EXT symptoms has yet to be studied. Previous research suggests that reduced problem solving

and increased negative affect are risk factors for engaging in EXT behaviors. For instance, poor social problem solving is related to impulsivity and aggression and predicts relapse in alcohol dependent individuals (McMurrin, Blair, & Egan, 2002; Ramadan & McMurrin, 2005). Similarly, negative affect is associated with alcohol consumption and aggression (Berkowitz, 1989; Witkiewitz & Villarreal, 2009). The research reviewed above (Ehring et al., 2009; Watkins & Moulds, 2005) suggests that abstract repetitive thought leads to both poor social problem solving and more persistent negative affect when compared with concrete repetitive thought. Thus, it is possible that abstract repetitive thought may be more strongly associated with EXT behaviors than concrete repetitive thought.

Current study

The current study contained two primary elements. First, it tested if repetitive thought has a causal role in EXT behavior. Concrete or abstract repetitive thought or distraction were experimentally induced to examine the effect of type of thought on in-laboratory alcohol consumption. First, it was hypothesized that individuals in both repetitive thought conditions will drink more than those in the distraction condition. Second, it was expected that individuals in the abstract condition would drink more than those in the concrete condition.

One exploratory analysis was also performed to assess the validity of conceptualizing repetitive thought as a transdiagnostic process. Namely, the study examined whether the relationship between repetitive thought condition and drinking is moderated by symptoms of psychopathology. If repetitive thought is truly a transdiagnostic process, then those with high levels of INT psychopathology should experience worse outcomes (i.e., more drinking) than those with fewer symptoms, and this relationship should strengthen in order from the distraction, to the concrete, to the abstract repetitive thought conditions.

Method

Participants

An *a priori* power analyses indicated that in order to achieve a power of .8 with significance level of .05 for the planned analyses, 150 participants were needed to detect a medium effect size. Participants included 174 individuals (65.4% female) recruited from undergraduate psychology courses at a large public university in the Southeast, who were compensated with extra credit towards a course grade. They were required to be at least 21 years of age, consume alcohol at least once per month, and be able to read and speak English. They ranged in age from 21 to 61 ($M = 24.06$, $SD = 6.38$). Participants self-identified their races/ethnicities as White/Caucasian (54.4%), Hispanic/Latino (22.1%), Black/African American (10.3%), Asian/Pacific Islander (6.6%), and other (6.6%). They were randomly assigned to the distraction ($N = 50$), abstract repetitive thought ($N = 54$), and concrete repetitive thought conditions ($N = 50$).

Measures and manipulations

INT psychopathology. Clinical level INT psychopathology was assessed using the Mini-International Neuropsychiatric Interview for DSM-IV (MINI; Sheehan et al., 1998), a structured diagnostic interview. The depression, dysthymia, and anxiety disorder (GAD, OCD, Panic Disorder, and Social Phobia) modules were administered to participants. The MINI is well validated, reliable, and used often in both clinical and research settings (Lecrubier et al., 1997; Pininti, Madison, Musser, & Rissmiller, 2003; Sheehan et al., 1997). MINI interviews were

recorded and one in four were double coded to ensure fidelity of diagnoses. Interrater reliabilities were high for all diagnoses: MDD ($K = 1.0$), dysthymia ($K = 1.0$), GAD ($K = .897$), OCD ($K = .656$), Panic ($K = .928$), and Social Phobia ($K = 1.0$). Coders met to resolve discrepancies and reach consensus. Only consensus values were used in data analyses.

In order to capture subclinical symptoms, participants also completed two self-report measures assessing general depression and anxiety symptoms. The first measure was the Center for Epidemiological Studies Depression Scale Revised (CESD-R; Eaton, Smith, Ybarra, Muntaner, Tien, 2004). The CESD-R asks participants to rate how often in the past week they have experienced 20 different symptoms of depression. Ratings include anchors of “rarely or none of the time”; “some or little of the time”; “occasionally or a moderate amount of the time”; and “most or all of the time.” The CESD-R has high internal consistency and exhibits convergent and discriminant validity in community and student samples (Van Dam & Earleywine, 2011).

The Beck Anxiety Inventory (BAI; Beck & Steer, 1990) was also administered. This questionnaire consists of 21 commonly experienced symptoms of anxiety. Participants rate how often they have experienced the symptom in the past month. Anchors include “not at all”; “mildly but it didn’t bother me”; “moderately-it wasn’t pleasant at times”; and “severely-it bothered me a lot”. The BAI is highly internally consistent and reliable over an 11-day period (Fydrich, Dowdall, & Chambless, 1992). Moreover, the BAI exhibits convergent and discriminant validity across outpatient, inpatient, and student samples (Contreras, Fernandez, Malcarne, Ingram, & Vaccarino, 2004; Fydrich et al., 1992; Jolly, Aruffo, Wherry, & Livingston, 1993). Using these three different measures of INT, an INT factor was created by performing a PCA with no rotation and extracting one factor, using Kaiser’s criterion.

Typical alcohol consumption. Two questions from the Daily Drinking Questionnaire (DDQ; Collins et al., 1985) were used to assess typical alcohol consumption in the past month. The first question requires participants to estimate the total number of standard drinks they consumed on each day during a typical week in the last month. These drinking totals are summed to create an estimate of typical weekly drinking. The second question asks participants how many drinks they consumed on their heaviest drinking day. A mean z-score of these two measures served as an index of typical drinking. The DDQ has adequate test-retest reliability and convergent validity with other measures of drinking habits (Collins et al., 1985).

In-lab alcohol consumption. Alcohol consumption was measured in the lab using an adaptation of the Taste Rating Task (Marlatt, Demming, & Reid, 1973). In this task, participants consume different beverages over a 15-minute period, rating them for taste, price, and color. Participants are led to believe that their ratings are being used as a measure of drink taste or product preference. In actuality, the variable of interest is their ad-libitum alcohol consumption during the task. This procedure is useful in predicting treatment outcomes in alcoholics (Miller, Hersen, Eisler, & Eichler, 1974), as well as ad libitum drinking (Tracey, Karlin, & Nathan, 1974). Furthermore, it is often used in experimental research (e.g., Stein, Goldman, & Del Boca, 2000). Notably, in order to minimize risks in this study, participants were only given nonalcoholic beer. Nonalcoholic beer provides an adequate placebo because participants blind to the type of beer rate it as analogous in alcohol content to light beer (Corcoran & Segrist, 1993). Furthermore, nonalcoholic beer is frequently used as an analogue in experimental alcohol administration research in college samples (e.g., Roehrich & Goldman, 1995).

Rumination manipulation. We induced abstract repetitive thought, concrete repetitive thought, or distraction using a procedure adapted from Santa Maria and colleagues (2012). In all conditions, participants wrote about a personally relevant event for 15 minutes.

In the repetitive thought conditions, participants selected the most distressing event that they experienced in the past year that still weighed heavily on their mind. During the initial session, participants provided a 1-3 sentence description of this event and rated it on a scale from 1 [not at all distressing] to 10 [extremely distressing]. In the abstract condition, participants were asked to write in an abstract, evaluative way about the distressing event (e.g., “why you feel the way you do when thinking about the distressing event: write about the reasons why you feel this way” and “what are the consequences of the event for your future: write about why the event may still be distressing for you in the future”). In the concrete condition participants were asked to write in a concrete, experiential way about the distressing event (e.g., “how did you experience the event: write about exactly what you saw, heard, thought and did during the event” and “how you could deal with such situations differently in the future: describe exactly what you would do”).

In the distraction condition, the event selected was an everyday activity, such as cooking a meal or getting ready for bed. Participants wrote about this event following a similar set of prompts to the other two conditions (e.g., “how have you felt: describe the feelings you have when performing the everyday action, moment-by-moment“ or “what are the reasons you perform these actions everyday: describe exactly why you perform them”). The full set of instructions for all conditions is provided in Appendix A.

Manipulation checks. Participants rated their level of self-focused thought on a scale of 1-100 to check for an effect of the repetitive thought induction, as compared to distraction

(Watkins & Moulds, 2005). To check for differences in level of construal between the abstract and concrete repetitive thought conditions, two independent, blind raters read participants' writing samples. Raters coded samples on a scale of 1 (concrete, not at all abstract) to 10 (abstract, not at all concrete) based on a specific set of instructions (Appendix B). The first 10 participants' writing samples were used to discuss coding rules and establish consistency between raters.

Procedure

The study flow is represented visually in Figure 1. Participants volunteered to participate in the study through an online registration system. They came into the lab for two different sessions. During the first session, they were presented with an informed consent form, describing the study as looking at relations between their thoughts, behaviors, and taste preferences. Participants were also given a demographic questionnaire, measures of INT, and asked to provide us with a 1-3 sentence description of the most distressing event that they have experienced in the past year. They then rated this event on a scale of 0 (not at all distressing) to 10 (extremely distressing). Because having the participants think of distressing events may prime repetitive thought processes, the participants returned to the lab 1-7 days later to undergo the experimental manipulations.

Participants returned to the lab and were placed into a room with a computer. They were then randomized to one of the three experimental conditions. In the repetitive thought conditions, they were presented with a computer printout of their described distressing event and the writing instructions. In the distraction condition, participants only received the writing instructions. They then wrote for 15 minutes at the computer about their respective events.

After finishing the writing exercise, participants completed the manipulation check and began the taste rating task. Participants were told that they would be rating one of a few different types of beverages, including sparkling water, soda, coffee, or beer. After checking a sheet, a research assistant informed the participant that he or she has been randomized to try different types of beer. The participant's ID was then checked to ensure the person was at least 21 years of age. During the taste rating task, the participant was presented with 12 oz. (355 mL) of three different non-alcoholic beers, each in identical cups. Beer was kept refrigerated until it was poured into the cups. Participants were also presented with a cup of water to rinse their mouths in between sampling different beers. The researcher then informed participants that they may take their time and sample as much of the drinks as they wanted in order to arrive at a decision for the various ratings. Next, the researcher left the room, informing the participants that he or she will check in later. After 15 minutes, the experimenter returned to check progress, collect all forms, and remove drinking materials. The remaining contents of each cup were poured into a graduated cylinder so that the amount consumed could be calculated.

Following the taste rating task, participants were presented with the DDQ and the B-YAACQ. In order to disguise the purpose of these questionnaires, they were presented with a series of filler items about consumption of soda, sparkling water, and coffee, as well as caffeine related consequences. Participants were told that we were interested in what types of consumers make what taste ratings, as a justification for these final questionnaires.

Finally, a credibility check and debriefing was performed, with participants being encouraged to express any doubts about the nature of the taste rating task (Roehrich & Goldman, 1995). In a face-to-face interview with an experimenter, participants were provided with information about the typical alcohol content of beers, wine, and spirits. They were then asked

to estimate how much alcohol was in the drinks that they consumed. Additionally, the interviewer probed the participants with several questions about the taste of the beverages, the purpose of the experiment, and how much they enjoyed participating. The purpose of these informal questions was to encourage the participant to divulge doubts about the taste rating task and allow the experimenter to determine if the deception was credible. After the interview was complete, participants were informed that the beers presented were nonalcoholic and encouraged to react freely, with experimenters logging participants' reactions. Debriefing occurred last, with participants being informed of the deception and the reasons for its use. They had the opportunity to withdraw their data from the study at this time, though none took this option.

Results

Randomization, manipulation and credibility checks

First, randomization checks were performed, using a series of ANOVAs and chi-square tests across groups. Randomization was effective in that groups did not differ on regular drinking, $F(2, 144) = .031, p = .870$, INT symptoms, $F(2, 96) = .567, p = .569$, or gender composition $\chi^2(2, N = 127) = .059, p = .971$. Additionally, the repetitive thought groups did not significantly differ on distress level for their chosen events, $F(1, 101) = .019, p = .89$.

Next, two manipulation checks were performed, using independent groups t-tests. First, differences between those in the repetitive thought conditions and those in the control group on self-focus were analyzed. Both groups indicated a large degree of self-focus following the writing task ($M_{repetitive\ thought} = 77.53, M_{distraction} = 74.62$), with no significant differences between groups, $t(152) = -.757, p = .450$. Next, differences in the abstraction level of writing samples between the abstract and concrete groups were assessed, using the average of the two raters scores (interrater correlation = .346, $p < .001$). There was a significant difference between the abstract ($M = 6.12, SD = 1.82$) and concrete ($M = 4.07, SD = 1.82$) repetitive thought groups on the degree of abstraction of the writing samples, $t(101) = 5.731, p < .001, d = 1.13$, with the abstract group rated as more abstract.

Additionally, a series of credibility checks were performed. The first ensured that participants believed they were consuming real beer. Specifically, participants were asked to estimate the alcohol content of beers that they consumed. On average, participants estimated the

alcohol content of the first beer to be 4.76% ($SD = 1.75$), the second beer to be 5.57% ($SD = 3.42$), and the third beer to be 4.83% ($SD = 2.29$). Thus, participants generally rated the nonalcoholic beers as containing about as much alcohol as a typical alcoholic beer. The second credibility check ensured that participants were willing to consume beer. These analyses indicated that 53.2% of participants enjoyed one of the beverages they sampled and 48.4% indicated that they would consider purchasing one of the beers for personal consumption. Consequently, many participants found the beers appealing. The final credibility check included analyzing whether participants guessed the purpose of the study (any participant that indicated the purpose of the study was to test a relation between experiencing or thinking about distress and the amount of alcohol consumed was considered to have guessed the study purpose). Eighteen such participants were identified. All analyses were run with and without these participants to ensure that results were not skewed by these individuals' responses. Notably, the same pattern of results emerged, so only results with all participants included are presented.

Effect of repetitive thought on drinking

On average, participants consumed 199.15 mL of beer ($SD = 179.28$), or approximately one fifth of a beer. In order to test the effect of repetitive thought on drinking, a one-way analysis of variance was performed, with condition as the independent variable and alcohol consumption as the dependent variable. There were no significant differences among the abstract ($M = 204.65$), concrete ($M = 201.40$), and distraction ($M = 191.02$) groups on mL of alcohol consumed, $F(2,148) = .078, p = .925$. Next, a regression was performed to test the interactive effect of INT and group membership on drinking. This analysis followed recommendations of Aiken and West (2001). Two dummy coded group variables were created for the effect of the abstract and concrete repetitive thought groups. Next, the INT variable was mean centered and

interaction terms were created between this mean centered variable and each dummy coded variable. Finally, the dummy coded variables, the INT variable, and the interaction terms were entered into a multiple regression analysis. As can be seen in Table 1, there were no significant main effects of group membership or INT level. Additionally, the effect of group membership on drinking was not significantly moderated by INT level. This analysis did not provide evidence for repetitive thought as a transdiagnostic process.

Discussion

This study assessed the effect of repetitive thought and construal level on alcohol consumption, in addition to investigating repetitive thought as a transdiagnostic process. The study had several strengths, including a large, adequately powered sample, a randomized controlled design, and an externally valid experimental manipulation. Tests of study hypotheses yielded several nonsignificant findings.

First, there were no significant differences among the control and experimental groups on the amount of alcohol consumed. This finding may be interpreted in several ways. It may indicate that repetitively focusing on negative events does not induce alcohol consumption. Alternatively, the lack of an effect of thought condition on beer consumption may be explained by an ineffective manipulation. Indeed, participants across condition exhibited a similarly high level of self-focus. Thus, the mere action of focusing on events in one's life, whether they be distressing or distracting, may induce repetitive thought and excess self-focus. For instance, self-referential thought prompts, absent of emotion-specific or event-specific language, have been shown to induce angry rumination among college students (Rusting & Nolen-Hoeksema, 1998). Consequently, the distraction condition in this experiment may have inadvertently induced rumination. To address this issue, future studies might use a distraction condition with a prompt to write or think about an external, emotionally neutral event, so as to avoid inducing rumination. A final possible explanation for these results is that the experimental situation did not adequately mimic the situations in which repetitive thought leads to drinking, despite an attempt to link the

repetitive thought process to a real, personally relevant event for participants. For example, natural instances of rumination or worry may be triggered by naturally occurring negative emotional experiences (Curci, Lanciano, Soleti, & Rimé, 2013), go on for long periods (Curci et al., 2013), or manifest with more emotional intensity, unlike those experienced during a 15-minute lab session. These factors could lead to a greater likelihood of using escapist coping behaviors than what can be observed in the lab. Further research could explore the relationship between naturally occurring repetitive thought and alcohol consumption in a naturalistic setting, using daily diary methods.

Second, there was no difference between the abstract and concrete repetitive thought conditions on the amount of beer consumed, despite the fact that there was a large difference in the level of abstraction between the writing samples of the two groups. This finding may indicate that repetitive thought yields the same effect on drinking, regardless of construal level. Previous research (e.g., Santa Maria et al., 2012) has only demonstrated an effect of construal level on negative affect or INT symptoms. Thus, abstract repetitive thought may be worse than concrete repetitive thought in the case of INT outcomes, but not EXT outcomes, like drinking. Further experimental and longitudinal studies on the effect of construal level on EXT and INT outcomes is necessary to clarify this finding.

Finally, there was not a significant interaction between INT symptoms and repetitive thought condition on drinking, which would be expected if repetitive thought is a transdiagnostic process. This nonsignificant finding may indicate that the effect of repetitive thought on drinking is independent of INT symptoms. Alternatively, it may be a consequence of the ineffective thought manipulation (i.e., an interaction effect may have been observed if there had

been a stronger main effect of condition). Future research might explore interactions between INT and repetitive thought using more effective thought inductions.

In summary, this study tested the relationship between negative repetitive thought and construal level on drinking, in addition to exploring whether this effect may depend on INT symptoms. There was neither a significant main effect of condition, nor a significant INT X condition interaction. These results may suggest that repetitive thought does not have an effect on drinking and that the effect does not depend on INT symptoms. Alternatively, the lack of significant results may be explained by an ineffective experimental manipulation. Future research should explore use of different, more effective thought inductions to measure the effect of negative repetitive thought on drinking and explore the transdiagnostic nature of the construct.

Tables and Figures

Figure 1: Study Flow

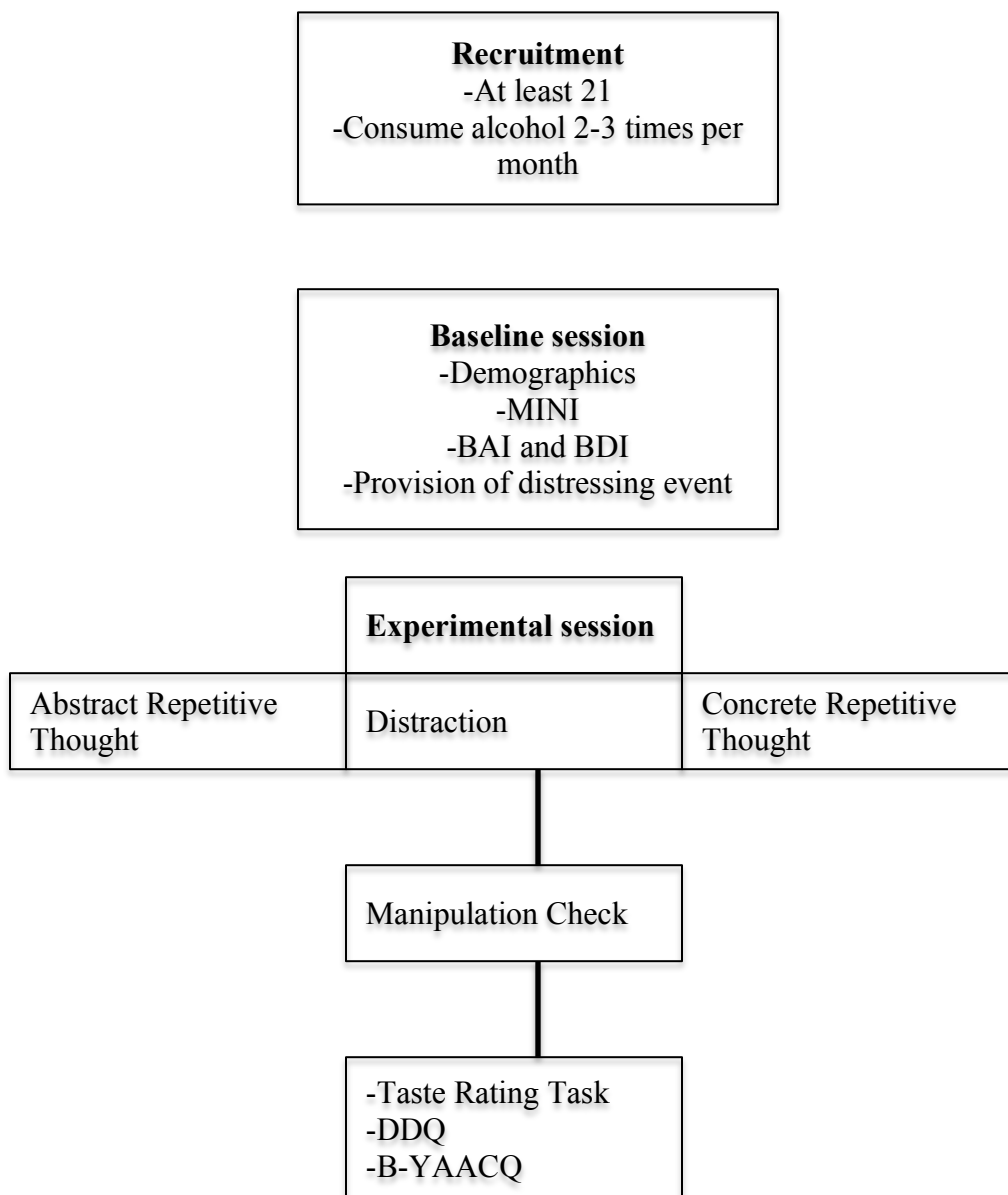


Table 1: Results of Linear Regressions Predicting in-lab Alcohol Consumption from Condition, INT Level, and Interactions

	B (SE)	Model R²
Abstract Group	10.97 (43.04)	
Concrete Group	32.84 (45.81)	
INT	14.29 (38.61)	
Abstract X INT interaction	-6.22 (47.07)	
Concrete X INT interaction	27.02 (56.56)	.11

Note. All effects are nonsignificant.

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Appendix A: Processing Mode Induction

Abstract-Evaluative Condition

Directions:

In the next 15 minutes, you will be asked to write about the distressing event you have experienced. It is important that you keep writing during the whole period of 15 minutes. Please write down everything immediately that comes up in response to the questions. Formal aspects, such as spelling or wording, are not important, so please don't worry about these aspects.

In particular, please write about:

- why you feel the way you do when thinking about the distressing event (write about the reasons why you feel this way)
- why the event happened (write about possible causes of the event)
- why you did not act differently during the event (write about the reasons for your own behavior before, during or after the event)
- what the consequences of the event for your future (write about why the event may still be distressing for you in the future).

Please write down all thoughts, feeling, images or memories that come up when thinking about the questions. If you realize that you are writing about things that are not related to the question, please re-focus on the questions. There are no correct or incorrect answers. In addition, spelling is not important. Please don't delete anything you have written.

Remember to write about:

- Why you feel the way you do when thinking about the event
- Why the event happened
- Why you didn't behave differently
- Which consequences the event will have for you in the future

Concrete-experiential condition

Directions:

In the next 15 minutes, you will be asked to write about the distressing event you have experienced. It is important that you keep writing during the whole period of 15 minutes. Please write down everything immediately that comes up in response to the questions. Formal aspects, such as spelling or wording, are not important, so please don't worry about these aspects.

In particular, please write about:

- how you feel (describe your feeling at this very moment while thinking about the event)
- how did you feel (describe the feelings you had during the event moment-by-moment)

- how you experienced the event (write about what exactly you saw, heard, thought and did during the event)
- how you could deal with such situations differently in the future (describe exactly what you would do).

Please write down all thoughts, feeling, images or memories that come up when thinking about the questions. If you realize that you are writing about things that are not related to the question, please re-focus on the questions. There are no correct or incorrect answers. In addition, spelling is not important. Please don't delete anything you have written.

Remember to write about:

- How you feel at the moment
- How you felt during the event
- What you saw, heard, thought and did during the event
- What exactly you can do to deal with such a situation differently in the future.

Distraction Condition

In the next 15 minutes, you will be asked to write about an everyday activity in detail. For example, you might describe a meal that you cook, or exactly what you do when you get ready in the morning/before you go to bed. It is important that you keep writing during the whole period of 15 minutes. Please write down everything immediately that comes up in response to the questions. Formal aspects, such as spelling or wording, are not important, so please don't worry about these aspects.

In particular, please write about:

- how you feel (describe your feeling at this very moment while thinking about the everyday event)
- how have you felt (describe the feelings you have when performing the everyday action, moment-by-moment)
- how you experience the everyday event (write about what exactly you see, hear, think and do during the event)
- what are the reasons you perform these actions everyday (describe exactly why you perform them)

Please, write down all the thoughts, feeling, images or memories that come up when thinking about the questions. If you realize that you are writing about things that are not related to the question, please re-focus on the questions. There are no correct or incorrect answers. In addition, spelling is not important. Please don't delete anything you have written.

Remember to write about:

- How you feel at the moment while thinking about the everyday activity
- How you felt during the everyday activity
- What you saw, heard, thought, and did during the everyday event
- The reasons you perform the everyday activity

Appendix B: Writing Sample Coding Instructions

Directions: You will be coding a series of writing statements about distressing personal events. Please code the writing samples on a scale from 1 (abstract, not at all concrete) to 10 (concrete, not at all abstract). Criteria for scoring a sample as abstract versus concrete are given below:

- Writing samples that represent the abstract end of the spectrum will focus on the essential gist and meaning of events and actions. Conversely, samples at the concrete end will focus on the specific contextual and incidental details of the event.
- Abstract samples will feature discussion of the desirability and importance of the event and its outcomes, without reference to the specific contextual factors that played a role in the event. In contrast, concrete samples will focus on how the event occurred, citing specific contextual factors and developing a plan for how the event might be avoided in the future.
- Highly abstract samples will also concentrate on the “why” aspects of the event (why it happened and what are its global implications), as opposed to the “how” aspects of the event (what actually happened and how specifically it could be avoided in the future).
- For example, a male may relate a story of a breakup after a serious relationship.
 - An abstract sample might discuss the reasons why the breakup occurred, why the man felt the way he did during the breakup and currently, why he behaved in the manner he did during the breakup, the importance of the breakup to his life, and the potential consequences of the breakup for the future. Discussion of the reasons for the breakup would focus on dispositional traits and global inferences (e.g., women are mean people or I am a general failure in relationships).
 - A concrete sample might merely describe the events—what was seen, heard, thought, and felt—during and after the breakup. It might also describe a specific plan for avoiding break ups in the future. Discussion of the reasons for the breakup would focus on contextual factors specific to the man’s particular situation (e.g., they broke up because the man could not spend enough time with his girlfriend due to work or they broke up because the man was jealous of his girlfriend spending too much time with other men).

Some identifiers that might appear in *abstract* samples include:

1. “The event happened because...”
2. “I reacted in this way because...”
3. “The reason I felt this way was...”
4. “The event will cause...”
5. “I feel the way I do about what happened because...”
6. “I did not act differently because...”
7. “This event means ____ for my future.”
8. “____ will happen to me because of this event.”

Some identifiers that might appear in *concrete* samples include:

1. "When thinking about the event, I feel _____."
2. "During the event I felt _____."
3. "I saw ..."
4. "I heard ..."
5. "I did ..."
6. "In the future I could avoid this event by..."
7. "I need to do _____ to prevent this this situation in the future"
8. "I will do _____ so that this event does not happen again"

Appendix D: IRB Approval Letter

2/20/2013
Andrew Kiselica Psychology
14416 Caribbean Breeze Drive
Tampa, FL 33613

RE:
Full Board Approval for Initial Review
IRB#: Pro00010997
Title: The Effect of Repetitive Thought and Construal Level on Alcohol Consumption
Study Approval Period: 2/15/2013 to 2/15/2014

Dear Dr. Kiselica:

On 2/15/2013, the Institutional Review Board (IRB) reviewed and APPROVED the above application and all documents outlined below.

Approved Item(s):
Protocol Document(s): Thesis--Kiselica
Consent/Assent Document(s)*: Informed Consent Form.pdf

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s).

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

John Schinka, Ph.D.,
Chair USF Institutional Review Board