

**Alcohol-Related Problems as Specific Correlates of Interpersonal-Psychological Theory of
Suicide Constructs**

by

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Abstract

The relationship between alcohol misuse and suicide ideation among undergraduate students has recently been investigated through the potential mechanisms of coping motives for drinking (Gonzalez, Bradizza, & Collins, 2009), and alcohol-related problems (Lamis & Malone, 2011). In the latter, the interpersonal constructs (i.e., perceived burdensomeness and thwarted belongingness) of the Interpersonal-Psychological Theory of Suicide (IPTS) were found to partially mediate the relationship between a uni-dimensional measure of alcohol-related problems and suicide proneness. In the current study we attempted to replicate and extend upon this previous work, by utilizing both uni and multi-dimensional measures of alcohol-related problems, including the constructs of the IPTS associated with acquired capability for suicide, using a more precise measure of suicide ideation as our outcome variable, and controlling for the effects of coping motives for drinking and sadness. In a sample of regularly drinking college students (N=295), our results suggested that the relationships between alcohol-related problems and the IPTS constructs are not specific to the subtype of alcohol-related problems experienced, and that these relationships are better accounted for by recent experiences of sadness. Implications of these findings for the IPTS, as well as suggestions for future research on this topic are discussed.

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As research on suicidal behavior in all forms (i.e., ideation, attempts, and death) has advanced, a number of distal and proximal risk factors have been identified as key antecedents to the behavior. Whereas distal factors, such as psychiatric illness, self-harming behaviors, family history of suicide, hopelessness, impulsiveness, and alcohol and substance abuse (Sher, 2006; Yoshimasu, Kiyohara, & Mityashita, 2008) increase an individual's lifetime risk for suicidal behavior, proximal risk factors, including interpersonal problems, employment issues, increased psychiatric disturbance, and increased alcohol consumption (Sher, 2006), increase an individual's immediate risk. Because alcohol misuse functions as both a distal and proximal risk factor, understanding the interplay between alcohol misuse and suicidal behavior is an important task for those interested in understanding and preventing suicide.

Existing evidence for alcohol misuse as a distal risk factor for suicidal behavior largely comes from research on individuals diagnosed with alcohol use disorders (AUDs). AUDs have a demonstrated relationship with suicide ideation (Borges, Walters, & Kessler, 2000; Kessler, Borges, & Walters, 1999), non-fatal suicide attempts (Kelly, Lynch, Donovan, & Clark 2001), and death by suicide (Cavanagh, Carson, Sharpe, & Lawrie, 2003; Wilcox, Conner, & Caine, 2004; Yoshimasu et al., 2008). Taken together, these findings suggest that those with an AUD are at an elevated risk of experiencing all types of suicidal behavior.

Nevertheless, the increased risk for suicidal behavior conferred by alcohol misuse is not limited to those with a diagnosable AUD. Although operationalized in a number of ways and often used interchangeably with the term *problematic drinking*, heavy drinking can be described as a pattern of higher alcohol consumption (encompassing a greater frequency, larger quantity, and greater number of binge drinking days) compared to one's peers (Berkowitz & Perkins, 1986; Ham & Hope, 2003). This pattern of alcohol consumption is associated with suicide

ideation (Gonzalez, Bradizza, & Collins, 2009; Gonzalez, Collins, & Bradizza, 2009; Reifman & Windle, 1995), non-fatal suicide attempts (Pfaff, Almeida, Witte, Waesche, & Joiner, 2007; Reifman & Windle, 1995), and death by suicide (Klatsky & Armstrong, 1993; Nakaya et al., 2007; Schneider et al., 2011). Although some have suggested that the relationship between alcohol misuse and suicidal behavior may be explained through co-occurring depressive symptoms, several studies have demonstrated that such symptoms do not fully account for the relationship (Borges et al., 2000; Gonzalez, Bradizza, et al., 2009; Gonzalez, Collins, et al., 2009; Reifman & Windle, 1995; Stephenson, Pena-Shaff, & Quirk, 2006). These findings suggest that the link between heavy drinking and suicidal behavior is non-spurious and extends beyond diagnosable AUD.

Drinking Motives, Alcohol-Related Problems, and Suicidal Behavior

Although the majority of the research on the link between alcohol misuse and suicidal behavior has been descriptive (Hufford, 2001), those who have looked for possible causal explanations have tended to focus on the relationship between suicide ideation and either coping motives for drinking (Gonzalez, Bradizza, et al., 2009; Gonzalez, Collins, et al., 2009) or the negative consequences of alcohol misuse (Duberstein, Conwell, & Caine, 1993; Lamis & Malone, 2011; Light, Grube, Madden, & Gover, 2003; Pirkola, Isometsa, Heikkinen, & Lonnqvist, 2000; Preuss et al., 2002).

Drinking motives have been conceptualized as the reasons why people choose to drink in a particular situation and have typically been divided into four distinct categories based on both the source of the motivation and the valence of the emotion behind it (Cooper, 1994; Cox & Klinger, 1988). Although all motives have been found to be associated with alcohol use, coping motives appear to be particularly pernicious. Coping motives have been found to be associated

with heavy drinking (e.g., Labouvie & Bates, 2002), alcohol-related problems even when controlling for alcohol consumption (Kassel, Jackson, & Unrod, 2000), and alcohol dependence (Carpenter & Hasin, 1998). More recently, coping motives have been found to be associated with solitary heavy drinking (Gonzalez, Collins, & Bradizza, 2009), suicide ideation among binge drinkers (Gonzalez & Hewell, 2012), and to statistically mediate the relationships between suicide ideation and both alcohol consumption and alcohol-related problems (Gonzalez, Bradizza, & Collins, 2009) among participants with a history of passive suicide ideation (SI). Although such findings have been interpreted as SI leading to drinking for coping motives (i.e., Gonzalez, Bradizza, & Collins, 2009), alternative explanations for these relationships cannot be ruled out. For instance, coping motives may actually increase negative affect over the long term, since avoidant coping strategies do not actually resolve problems, which could lead to increased suicide ideation. Additionally, the association may not persist once other related variables (e.g., depressive symptoms, alcohol-related problems) are taken into account. Furthermore, despite the association between coping motives for drinking and suicide ideation, we do not yet know if coping motives are also associated with more severe forms of suicidal behavior.

In studies investigating alcohol-related problems as a potential cause of the relationship between alcohol use and suicidal behavior, certain alcohol-related problems are positively associated with suicide ideation and attempts (Duberstein et al., 1993; Light et al., 2002; Preuss et al., 2002), as well as death by suicide (Pirkola et al., 2000). However, alcohol-related problems are also positively associated with coping motives for drinking (Cooper, Frone, Russell, & Mudar, 1995; Carey & Correia, 1997; Gonzalez, Bradizza, et al., 2009; Merrill & Read, 2010). Although it is clear that there are associations between alcohol-related problems and all forms of suicidal behavior, again the significance of these relationships when

conceptually-related variables, such as drinking for coping motives and sadness, are taken into account cannot be determined from the accumulated research. Given that drinking motives are typically conceptualized as antecedents to drinking that may decrease in salience once drinking habits are established (Kuntsche, Knibbe, Gmel, & Engels, 2005), whereas alcohol-related problems are viewed as negative outcomes of alcohol misuse over both the short and long term (Perkins, 2002), in the current paper we focus more heavily on the ways in which alcohol-related problems may be conceptually linked to suicidal behavior. At the same time we consider the possibility that coping motives for drinking and/or depressive symptoms may better explain the relationship between suicidal behavior and alcohol misuse.

Theoretical Explanations of Suicidal Behavior

The Interpersonal-Psychological Theory of Suicide (IPTTS; Joiner, 2005; Van Orden et al., 2010) has been proposed as a comprehensive, falsifiable theory purported to explain all forms of suicidal behavior. According to this theory, when experienced in isolation thwarted belongingness (i.e., social disconnection, lack of close others) and perceived burdensomeness (i.e., negative self-view, feelings of liability) cause passive suicide ideation (Joiner, 2005; Van Orden et al., 2010). When experienced in combination with the idea that these states are stable and unchanging (i.e., hopelessness), passive suicide ideation will transform into an active desire for death (Joiner, 2005; Van Orden et al., 2010). These tenets of the IPTTS have been supported by preliminary empirical studies demonstrating a statistical interaction between perceived burdensomeness and thwarted belongingness in the prediction of suicide ideation (Van Orden, Witte, Gordon, Bender, & Joiner, 2008; Joiner et al., 2009).

In that the IPTTS cites the experiences of thwarted belongingness and perceived burdensomeness as causes of suicide ideation, it is in line with previous explanations of suicidal

behavior that emphasize social disconnection (Durkheim, 1897) and negative self-view (Baumeister, 1990; Joiner, 2005; Van Orden et al., 2010; Shneidman, 1998). However, the IPTS departs from previous explanations of suicidal behavior by stating that individuals will not act on their suicidal desire, no matter its intensity, without the presence of a third construct (Joiner, 2005; Van Orden et al., 2010). This third construct is the acquired capability for suicide, and can be broken down into the components of fearlessness about death and increased pain tolerance (Joiner, 2005; Smith & Cukrowicz, 2010; Van Orden et al., 2010). The rationale for this construct arose in part from the consistent finding that suicide ideation is far more common than non-fatal and fatal suicide attempts (e.g., McIntosh, 2012), indicating that suicide ideation in isolation is not sufficient to produce lethal suicidal behavior.

Joiner (2005) states that although no one is born with the ability to take his or her own life, repeated exposure to fear-inducing and painful events can habituate an individual to physical pain and/or fear of death. Joiner (2005) proposes that although one's initial response to any life-threatening stimulus is intense fear, repeated exposure causes habituation, resulting in the reduction of that fear (Van Orden et al., 2010), with the same process holding true for painful stimuli. Evidence of how habituation to both the fear and pain associated with suicidal behavior occurs is most clearly reflected in studies showing that those who have previously attempted suicide report less fear of suicide (Linehan, Goodstein, Neilsen, & Chiles, 1983; Malone et al., 2000) and higher pain tolerance (Orbach, Palgi, et al., 1996; Orbach, Stein, et al., 1996) than individuals who have not previously attempted.

Although a history of non-fatal suicide attempts is proposed as the most potent way to acquire the capability for suicide, Joiner (2005) explains that exposure to other painful and life-threatening experiences can have a similar effect (Van Orden et al., 2010). In support of this

notion, researchers have found that exposure to various painful and provocative events (e.g., shooting a gun, physical fighting; Van Orden et al., 2008), combat exposure (e.g., Bryan, Cukrowicz, West, & Morrow, 2010), and engaging in impulsive behaviors (e.g., Bender, Gordon, Bresin, & Joiner, 2011), are associated with heightened acquired capability for suicide. These findings suggest that habituation to the fear and pain associated with suicide can arise from exposure to a variety of fear-inducing and painful stimuli and is not limited to previous suicidal behavior. Such an understanding of suicidal behavior explains why, although suicide attempts tend to increase in lethality as multiple attempters habituate to the pain and fear involved, many individuals (who have presumably acquired the capability for suicide through other experiences) die by suicide on their first attempt (Rudd, Joiner, & Rajab, 1996; Van Orden et al., 2010). In summary, the IPTS states that only under the simultaneous conditions of thwarted belongingness, perceived burdensomeness, fearlessness about death, and increased pain tolerance will an individual make a lethal or near lethal suicide attempt (Joiner, 2005; Van Orden et al., 2010).

Specifying Relations among Alcohol-Related Problems and IPTS Constructs

Distinguishing the ways in which alcohol-related problems link to the constructs of the IPTS could be important because the kinds of alcohol-related problems individuals experience may put them at greater risk for suicidal behavior. Although the relationships among specific types of alcohol-related problems and the constructs of the IPTS have yet to be empirically investigated, others have theorized that the consequences of alcohol misuse affect different realms of a heavy drinker's life (Perkins, 2002; Read, Kahler, Strong, & Colder, 2006). As discussed in more detail in the following section, depending upon the realm a problem affects, it ought to be differentially associated with IPTS constructs.

Alcohol-related problems and thwarted belongingness. Joiner (2005) argues that prolonged substance use has powerful negative effects on one's social support system, and therefore, individuals with prolonged substance use may have higher levels of thwarted belongingness compared to other populations. In support of this argument, Joiner (2005) cites a literature review examining the social ties of individuals with AUDs (Akerlind & Hornquist, 1992). A main conclusion of this review was that those with AUDs report more loneliness than others. This finding has been supported by more recent studies demonstrating that heavy drinking in the general population is associated with marital problems ranging from dissatisfaction to violence (Marshall, 2003), and that those with AUDs (and other drug dependencies) experience a wide range of interpersonal problems (Doumas, Blasey, & Mitchell, 2006). Additionally, social disconnection and interpersonal conflict are associated with death by suicide among heavy drinkers (Pirkola et al., 2000) and with suicide ideation and attempts among those with AUDs (Preuss et al., 2002; You, Van Orden, & Conner, 2011). Thus, one specific problem associated with heavier alcohol use patterns is decreased positive social relationships, and as the IPTS would predict, this consequence is associated with suicidal behavior. In the current study, we anticipated that alcohol-related problems of an interpersonal nature (i.e., social problems) would be uniquely and positively associated with thwarted belongingness.

Alcohol-related problems and perceived burdensomeness. There are also alcohol-related problems that seem relevant to perceived burdensomeness. McNally, Palfai, Levine, and Moore (2003) demonstrated that one reason why individuals engage in heavy drinking is to cope with low self-esteem. Brady (2006) explains that although it remains unclear in the literature if alcohol misuse furthers negative perceptions of the self, some have argued that alcohol misuse

may lower self-esteem and through this, increase risk for suicide (Kendall, 1983; Lester, 1992). Some evidence for this view has been established in cross-sectional studies that found both an inverse correlation between self-esteem and alcohol consumption (Glindermann, Geller, & Fortney, 1999; Lewis & O'Neil, 2000) and that heavy drinkers have a greater tendency to make shameful attributions for their mistakes in a variety of hypothetical situations (Dearing, Steuwig, & Tangney, 2005). Additionally, a longitudinal study in a sample of high school students found that those with consistently low, and importantly those with decreasing levels of, self-esteem reported the highest rates of drinking (Zimmerman, Copeland, Shope, & Dielman, 1997). This finding indicates a possible reciprocal relationship between alcohol misuse and self-esteem in which students with initially low levels of self-esteem drink heavily, and those with somewhat low levels drink heavily and experience additional drops in self-esteem after the onset of heavy drinking. Though such findings have not definitively answered the question regarding the temporal ordering of the alcohol misuse-self-esteem relationship, they clearly demonstrate its existence. Furthermore, low self-esteem has been specified as a key component of perceived burdensomeness (Joiner, 2005; Van Orden, 2010). Though lowered self-esteem has not traditionally been measured on alcohol-related problem scales, a recently developed scale includes such problems, and they have been found to correlate well with other, more frequently measured problems (Read et al., 2006). Thus, one way that alcohol misuse may link to perceived burdensomeness is through its association with self-esteem.

Additionally, Perkins (2002) lists academic impairment and legal repercussions among other consequences associated with heavy drinking in college student populations. In that these particular types of problems could result in an individual feeling like a liability to others, they too could be associated with perceived burdensomeness. Similarly, others have found that job

loss and financial hardships are associated with death by suicide among heavy drinkers (Pirkola et al., 2000) and suicide ideation and attempts among those with an AUD (Preuss et al., 2002). However, the relationship between a broadened sense of role failure, perceived burdensomeness, and suicidal behavior among alcohol misusers has not yet been empirically investigated. In the current study we investigated this link, expecting to find unique and positive associations between perceived burdensomeness and the alcohol-related problems of negative self-esteem and occupational and academic impairment.

Alcohol-related problems and acquired capability. Although experiences of the aforementioned types of alcohol-related problems would be expected to increase suicide ideation through their associations with thwarted belongingness and perceived burdensomeness, those who experience only these types of problems would not be expected to attempt or die by suicide without also acquiring the capability to do so. Joiner (2005) makes the case that substance users experience a variety of frightening and painful events as a direct result of their use. In support of this notion, heavy drinkers are at an increased risk of experiencing the less common alcohol-related problems associated with physical risk (Kahler, Strong, Read, Palfai, & Wood, 2004; Vik, Carrello, Tate, & Field, 2000) including risky sexual practices, driving while intoxicated, physical fights, near alcohol-poisoning, and accidental injury (Borges et al., 2006; Kelly, Lynch, Donovan, & Clark, 2001; McLeod, Stockwell, Stevens, & Phillips, 1999; Perkins, 2002). Given that such experiences, especially when they occur repeatedly, may habituate heavy drinkers to the pain and fear associated with death, we expected that these types of alcohol-related problems would be uniquely associated with the two components of acquired capability.

Previous Research on the IPTS and Alcohol-Related Problems

To our knowledge, there has only been one study investigating the relationship between alcohol-related problems and the main constructs introduced by the IPTS. Specifically, Lamis and Malone (2011) demonstrated that thwarted belongingness and perceived burdensomeness mediated the relationship between alcohol-related problems (as measured by the Rutgers Alcohol Problem Index [RAPI]; White & Labouvie, 1989) and suicide-proneness (as measured by the Life Attitudes Schedule-Short Form [LAS-SF], Rohde, Lewinsohn, Langhinrichsen-Rohling, & Langford, 2004). Although this study is a first step in discovering why those who engage in heavy drinking are at an increased risk for all types of suicidal behavior, there are several limitations that hinder our ability to draw firm conclusions from this study.

The first limitation is the choice of measure for suicidal behavior used in this study. The outcome measure of suicide-proneness (LAS-SF; Rohde et al., 2004) correlates only modestly with single-item measures of lifetime suicide ideation ($r = .35$) and past attempts ($r = .25$; Rohde, Seeley, Langhinrichsen-Rohling, & Rohling, 2003). Relatedly, the lack of clarity in scale items makes it impossible to know which items demonstrate ideation and which are related to attempts. One major advantage of the IPTS is that it makes different predictions about the combination of constructs that lead to different suicidal behaviors (i.e., passive ideation, suicidal desire, suicidal intent, and suicide attempt; Joiner, 2005; Van Orden et al., 2010); unfortunately, the LAS-SF does not allow for the parsing out of such behaviors. Similarly, the failure of Lamis and Malone (2011) to measure acquired capability limits the understanding of how alcohol-related problems might prepare individuals to be able to act on suicide ideation. Lastly, in that the LAS-SF includes at least one item pertaining to binge drinking, its use in a study examining the

relationship between suicide proneness and alcohol-related problems is an example of criterion contamination (Miller, McIntire, & Lovler, 2011).

In addition to the limitations noted above, the uni-dimensional nature of the measure used for alcohol-related problems (i.e., the RAPI; White and Labouvie, 1989) in the Lamis and Malone (2011) study does not provide the most informative understanding of which types of alcohol-related problems are associated with thwarted belongingness and which are associated with perceived burdensomeness. As explained earlier, thwarted belongingness and perceived burdensomeness are different constructs, and while they do have some commonalities, a recent factor analytic study has demonstrated that these constructs are distinguishable from one another (Van Orden, Cukrowicz, Witte, & Joiner, 2012). As explained above, there is good reason to believe that some problems associated with alcohol misuse (e.g., loneliness, loss of friends, marital and family issues) are more indicative of thwarted belongingness, whereas others (e.g., academic impairment, shame and low self-esteem, legal issues) are more indicative of perceived burdensomeness. If such differences do exist, this could have important consequences for tailoring treatment for individuals who present with different compilations of alcohol-related problems.

The Current Study

In the current study we sought to both replicate and extend the findings of Lamis and Malone's (2011) study while using more optimal measures of both passive suicide ideation and alcohol-related problems. To this end, and in consideration of the findings presented earlier, we tested the following three hypotheses regarding the relationships among alcohol-related problems, IPTS variables, and passive suicide ideation:

1. In a model utilizing a uni-dimensional measure of alcohol-related problems, we predicted that alcohol-related problems would be positively associated with all constructs of the IPTS and passive suicide ideation. Furthermore, we predicted that thwarted belongingness and perceived burdensomeness would partially mediate the relationships between alcohol-related problems and passive suicide ideation. Such findings would provide support for the model presented by Lamis and Malone, 2011, and would establish the existence of a relationship between alcohol-related problems in general and all constructs of the IPTS. However, such a model would not clarify which types of alcohol-related problems are most strongly related to each of the separate IPTS constructs.
2. We expected that differential associations would emerge among subtypes of alcohol-related problems and constructs of the IPTS when a multi-dimensional measure of alcohol-related problems (i.e., YAACQ; Read et al., 2006) was utilized. Specifically, we expected that interpersonal alcohol-related problems (i.e., social/ interpersonal YAACQ subscale) would be most strongly associated with thwarted belongingness, that alcohol-related problems associated with self-perception and care (i.e., self-perception and self-care YAACQ subscales) as well as academics and work (i.e., academic/occupational YAACQ subscale), would be most strongly associated with perceived burdensomeness, and that alcohol-related problems associated with risk-taking (i.e., risky behavior YAACQ subscale) and physical injury (i.e., blackout drinking YAACQ subscale) would be most strongly associated with both facets of acquired capability. Considering these anticipated differential associations among subtypes of alcohol-related problems, we further expected that significant

relationships would exist between passive suicide ideation and the subtypes of alcohol-related problems associated with thwarted belongingness and perceived burdensomeness, and that these relationships would be partially mediated by thwarted belongingness and perceived burdensomeness.

3. We finally proposed that the relationships between alcohol-related problems (conceptualized as a uni- or multi-dimensional construct dependent upon results of analyses testing hypothesis 2), IPTS variables, and passive suicide ideation would remain significant when a symptom of depression (i.e., sadness) and coping motives for drinking are taken into account.

In sum, we expected that alcohol-related problems would be associated with all constructs of the IPTS and passive suicide ideation, that these associations would be specific to the types of alcohol-related problems experienced, and that these associations would be non-spurious when conceptually related variables were taken into account.

Method

Participants and Procedure

Participants in this study were undergraduate students, age 19 or older, who were enrolled in psychology courses at a large southeastern university. In order to achieve an approximately equivalent gender distribution, we intentionally oversampled for males (i.e., added an inclusion criterion of male gender once a sufficient number of females participated during each semester of data collection). Following a protocol approved by the university's internal review board (IRB), the study was advertised on the psychology department's web-based research system. To protect participants from identifying themselves as regular drinkers, the study was described as a brief, online survey examining the thoughts, feelings, and behaviors of young adults. Students who met the age criterion and were interested in participating were able to enroll through the department's web-based system. Upon signing up, participants were provided with a one-time use web link which redirected them to the survey hosted on a secure website. After reading through the information letter and agreeing to the procedures, participants were presented with the measures, which were available for completion at the participant's leisure. The majority of participants spent between 22 (25th percentile) and 42 (75th percentile) minutes completing the measures; however, the amount of time spent with the browser window open ranged from seven seconds to 12 days. Data for this study were collected anonymously and upon completion of the survey (or active opting to discontinue by clicking a box at the bottom of the screen), participants were automatically awarded research credit to count toward extra credit points for one of their psychology courses. Participants were included in the analyses reported

here if they 1) reported consuming at least four alcoholic beverages in the past month (excluded $n=257$; Gonzalez, Bradizza, & Collins, 2009), and 2) were not flagged as “inattentive responders” based on the embedded screening measure (excluded $n=92$; Meade and Craig, 2011; described in more detail below).

Our final sample consisted of 295 college students who engage in regular drinking (43% male; $n= 127$) with an average age of 20.6 years (S.D.= 1.7; range= 19-31). A problem with the display settings of survey questions prevented data on race from being collected from all participants; this problem was addressed after the majority of the data had already been collected. Of the participants that met inclusion criteria and from whom data on race was collected ($n=84$), 88% selected Caucasian as their primary race, 6% selected Asian American and the remaining 6% selected African American. These figures are comparable to those of both the liberal arts department (82% Caucasian) and the total student population (81% Caucasian) of the university (Auburn University Office of Institutional Research and Assessment, 2013), and therefore are likely representative of the sample as a whole. The vast majority of participants (97%, $n= 287$) reported their ethnicity as non-Hispanic/Latino. All years in undergraduate studies were represented well in our sample, with 13% ($n= 38$) of participants in their first year, 25% ($n= 75$) in their second year, 28% ($n=81$) in their third year, 26% ($n= 78$) in their fourth year, and 8% ($n= 23$) in their fifth year or beyond. The modal grade point average (GPA) range reported was between a 3.00-3.49 (37%; $n=111$). Five percent of participants ($n=15$) reported their GPA as a 4.00, 23% ($n=68$) reported it as falling between a 3.50-3.99, 23% ($n=69$) reported it as falling between a 2.50-2.99, and 12% reported it as falling at or below a 2.49. The majority (56%, $n=166$) of participants reported their marital status as single, 39% ($n=115$), reported being in a

committed relationship, and the remaining 5% reported being married ($n=1$), engaged ($n=5$), divorced ($n=1$), or living with a partner ($n=7$).

Measures

Alcohol consumption. For descriptive purposes, we assessed alcohol consumption in this study using the timeline follow back method (TLFB; Sobell & Sobell, 1992). Participants were provided with an online calendar marked with federal and university holidays and a standard drink conversion chart, and were instructed to fill in each calendar date with the total number of standard alcoholic beverages consumed on that date. This method has been used widely in both clinical and nonclinical populations, has demonstrated acceptable psychometric properties, and is often preferred over typical quantity-frequency measures when used with individuals who do not have regular daily drinking patterns (Sobell & Sobell, 1995). The calendar included the month in which the measures were completed as well as the three months prior, and participants were asked to report for each of the 90 days prior to the date of their participation in the study.

Although we had intended to use the full 90-day reporting period, many participants included only partial months for either the most and/or least recent months within the reporting period. An examination of the data showed that participants were most likely to provide complete data for the full month prior to the month in which they completed the survey. For this reason, we opted to use the total number of drinks reported in the 30-day month (or most recent thirty days in months with more or less than thirty days) prior to the month in which the participant completed the survey measures as the alcohol consumption variable (e.g., “alcohol consumption” for a participant completing the survey on September 8th would be the total number of drinks reported on August 2nd-31st). The mean number of total drinks reported was

29.4 ($SD= 26.2$, range 4.0-115.2), and approximately 50% of the sample reported consuming 21 or more drinks in the specified time period.

Alcohol related problems. The Brief Young Adult Alcohol Consequences Questionnaire (B-YAACQ; Kahler, Strong, & Read, 2005) was used as a uni-dimensional measure of alcohol-related problems. The B-YAACQ is a 24-item measure of alcohol-related problems that utilizes a dichotomous (present or absent) scoring format. Unlike the full YAACQ (described below), the B-YAACQ was designed using Rasch modeling (Rasch, 1960). This modeling procedure creates a measure that assesses an underlying construct along a continuum; thus, higher scores on the B-YAACQ not only indicate a wider variety of alcohol related problems but also reflect a more severe pattern. In our sample, the mean score on this measure was 11.25 ($SD= 6.35$, range 0-24). According to Kahler and colleagues (2005), a score of about 10 indicates the likely presence of some important consequences, whereas a score of about 15 may indicate the presence of symptoms consistent with AUD; that said, it appears our sample adequately reflects a wide range of participants in terms of alcohol-related problems. In our sample, the internal consistency of the B-YAACQ (Cronbach's $\alpha=.91$) was excellent.

In analyses testing for differential associations among subtypes of alcohol-related problems and the IPTS constructs (i.e., hypothesis 2), each of the eight subscales of the 48-item Young Adult Alcohol Consequences Questionnaire (YAACQ; Read et al., 2006) were used as separate, domain-specific, measures of alcohol-related problems. The developers of this scale have shown it to have strong psychometric properties when used as either a uni-dimensional or multi-dimensional measure (Read, Merrill, Kahler, and Strong, 2007), with a confirmatory factor analysis providing evidence of differential item loading onto the eight separate but related factors that comprise the eight subscales (i.e., social/interpersonal, self-care, physiological dependence,

self-perception, impaired control, academic/ occupational, risky behavior, and blackout drinking; Read et al., 2006).

The YAACQ was created with a dichotomous scoring format (i.e., each problem is recorded as present or absent within the reporting period), which precludes the assessment of the frequency of occurrence of each of the alcohol-related problems. This inability to assess frequency has been cited as one of the major criticisms of this measure (Devos-Comby & Lange, 2008). However, Kahler et al. (2004) have argued that frequency of occurrence is relatively unimportant when assessing the degree of alcohol-related problems experienced. Furthermore, they found strong correlations among dichotomous and frequency based scoring methods for measures of alcohol related problems similar to the YAACQ (Kahler et al., 2004).

Given the importance that repeated experience plays in the habituation process that must occur to acquire the capability for suicide (Joiner, 2005; Van Orden et al., 2010), we chose to modify the YAACQ to include a frequency scale. On the modified version of this scale, participants were asked to rate how often they had experienced each alcohol-related problem on a 1(*never*) to 5(*more than 10 times*) scale (similar to the RAPI; White & Labouvie 1989). In our sample this version of the full scale was highly correlated with the dichotomously-scored format ($r = .92$). The mean score on the frequency version of the full scale was 33.50 ($SD = 27.31$). The internal consistency of both the full scale measure (Cronbach's $\alpha = .95$) and each of the eight subscales (social/interpersonal subscale Cronbach's $\alpha = .81$, self-perception subscale Cronbach's $\alpha = .78$, self-care subscale Cronbach's $\alpha = .84$, academic/ occupational subscale Cronbach's $\alpha = .79$, risky behavior subscale Cronbach's $\alpha = .81$, blackout drinking subscale Cronbach's $\alpha = .84$, physical dependence subscale Cronbach's $\alpha = .66$, impaired control subscale Cronbach's $\alpha = .74$), was adequate.

Coping motives for drinking. The coping motives subscale (5 items) of the 20-item, self-report Drinking Motives Questionnaire (DMQ; Cooper, 1994) was used to measure a subset of the reasons for which participants reported they would be likely to drink. Items on this questionnaire are rated on a 5-point Likert scale from 1-5 to indicate how frequently the participant drinks for each specified reason. The DMQ has demonstrated strong psychometric properties (Cooper, 1994). The coping motives subscale of the DMQ was included as a separate covariate to test hypothesis 3. In our sample the internal consistency of this subscale (Cronbach's $\alpha=.85$), was good.

Thwarted belongingness and perceived burdensomeness. The 15-item self-report Interpersonal Needs Questionnaire (INQ; Van Orden et al., 2012) was used to assess thwarted belongingness (nine items) and perceived burdensomeness (six items). Participants used a 7-point Likert scale to indicate how well each item described them. Scores for each subscale were computed by averaging the items thus total scores on each of the subscales range from 0-6. Higher scores on the subscales indicate higher levels of each of the constructs. A recent study of the psychometric properties of the INQ indicated that this scale measures perceived burdensomeness and thwarted belongingness, can be used with diverse populations, and correlates well and in the expected direction with similar constructs (Van Orden et al., 2012). In our sample, the mean was 0.98 ($SD= 1.02$) on the thwarted belongingness subscale, and 0.20 ($SD=0.51$) on the perceived burdensomeness subscale. The internal consistencies for both the thwarted belongingness (Cronbach's $\alpha=.89$) and perceived burdensomeness (Cronbach's $\alpha=.92$) subscales were excellent.

Fearlessness about death. The seven-item, self-report Acquired Capability for Suicide, fearlessness about death subscale (ACSS-FAD; Ribeiro et al., 2014) was used to assess

fearlessness about death. Participants rated items on a 5-point Likert scale, in order to indicate the degree to which each item describes them. Total scores can range from 0 to 28, with higher scores indicative of greater fearlessness about death. In a recent study of the psychometric properties of this subscale, Ribeiro and colleagues (2014) found evidence of good factor structure and discriminant and convergent validity. In the current sample the mean score on fearlessness about death was 21.48 ($SD= 6.44$). The internal consistency of this scale (Cronbach's $\alpha=.86$) was good.

Pain tolerance. The seven-item, self-report Discomfort Intolerance Scale (DIS; Schmidt, Richey, Fitzpatrick, 2006) was used to assess self-reported pain tolerance. Items are rated on a 7-point Likert scale to indicate the degree to which they are descriptive of the participant. Total scores can range from 0 to 42, with higher scores indicative of higher pain tolerance. In a preliminary investigation of the psychometric properties of the DIS, it was found to correlate well and in the expected directions with relevant constructs, evidencing good convergent and discriminant validity (Schmidt, Richey, & Fitzpatrick, 2006). The mean score in our sample was 29.34 ($SD= 6.87$). The internal consistency for the DIS was acceptable (Cronbach's $\alpha=.71$).

Passive suicide ideation. To measure passive suicide ideation in our sample we used the first five items of the Beck Suicide Scale (BSS; Beck & Steer, 1991). On this measure, participants are asked to rate 21 items on a scale ranging from 0-2, regarding their suicidal thoughts and behaviors. We opted to use only the first five items of this scale for two reasons. First, in this study we were interested only in passive suicide ideation. Factor analytic research has indicated that the first 19 items of the BSS (items 20 and 21 assess frequency and severity of suicide attempts and are typically not included when the measure is intended to assess various degrees of suicidal ideation), measure two separate factors: suicide ideation and desire, and

resolved plans and preparation (RPP; Steer et al., 1993; Holden & DeLisle, 2005; Joiner, Rudd, & Rajab, 1997; Witte et al., 2006), with the first five items generally loading more strongly onto the suicide ideation and desire factor. Second, the first five items were designed as a screener (Beck, Brown, and Steer, 1997). In this study, as is typical with this measure, only those participants who reported a desire for suicide (score of greater than 0 on items 4 and/or 5) were instructed to complete items 6-19. In our sample, 5% ($n=14$) of all participants were required to complete items 6-19. Thus because we only sought to analyze passive suicide ideation, and because the majority of our sample did not complete items beyond the first five screener items, we felt justified in using the total score on the BSS items 1-5 as our measure of passive suicide ideation. In our sample the mean score on this measure was 0.19 ($SD=0.54$, range 0.00-2.63). The internal consistency of the abbreviated version of this scale was acceptable (Cronbach's $\alpha=.75$).

Sadness. We used item 18 (*I felt sad.*) from the Center for Epidemiologic Studies of Depression Scale (CES-D; Radloff, 1977) as a covariate in the second path analytic model in order to control for recent experiences of sadness. This item was selected from the full 20-item scale as a covariate because it is a common symptom of depression and because there was strong conceptual overlap between the other CES-D items and the INQ. Participants were asked to rate the frequency of times during the past week when they felt sad on a four-point scale ranging from *rarely, less than 1 day* to *most or all of the time, 5-7 days*. The mean score on this item was 0.69 ($SD=0.77$, range 0-3).

Bogus Items (Meade & Craig, 2011). In order to check for the presence of and screen out inattentive responders, we included eight bogus items embedded within our other study measures. Such items can only logically be endorsed in one direction (e.g., *I sleep less than one*

hour per night) and have been found to be among the most sensitive identifiers of potential inattentive responders (Mead & Craig, 2011). In order to identify inattentive responders within our data set, individuals who completed the survey in five minutes or less ($n=44$) were first screened out, as such a completion time was dramatically lower than the average, and likely was an indicator that participants were clicking through the survey without reading the items. Once this was done, the screening criterion of reporting four or more drinks in the previous month was applied, and only those who met this criterion were included in the final screening procedure ($n=343$). In the sample that met the inclusion criterion, we finally flagged participants who answered two or more of the bogus items incorrectly (10% of the remaining sample; $n=48$).

Results

Descriptive statistics for all study variables, computed using IBM SPSS version 21.0, are provided in Table 1. All univariate outliers were fenced in at 3 standard deviations above or below the mean. Zero-order correlations among variables are reported in Table 2. These correlations were inspected to gain a preliminary understanding of the relationships among study variables. As can be seen in Table 2, alcohol-related problems, regardless of the how this construct was measured (i.e., either the B-YAACQ or the eight YAACQ subscales) tended to have modest, positive correlations with both thwarted belongingness and perceived burdensomeness, but not with passive suicide ideation, pain tolerance, or fearlessness about death. A similar pattern of results emerged among coping motives for drinking and the IPTS and passive suicide ideation variables, with the exception of a modest, negative correlation with fearlessness about death. Notably, gender (coded 0 = male; 1 = female), thwarted belongingness, perceived burdensomeness, and sadness had positive correlations with passive suicide ideation. Zero-order correlations were also utilized to test for differential associations between subtypes of alcohol-related problems and the constructs of the IPTS (described in detail below).

To compute zero-order correlations and to test all path models, we used Mplus Version 7.1 (Muthen & Muthen, 1998-2012) and the robust maximum likelihood (MLR) estimator. This estimator was chosen because it is robust against non-normality (Brown, 2006), and some of the variables included within the models did not follow a normal distribution. When investigating the indirect effects in each model, we used a bias-corrected bootstrapping (BC) procedure with

5,000 resamplings (Preacher & Hayes, 2008). Individuals who met criteria based on age, alcohol consumption, and attentive responding, and who had data for at least one of the included variables were included in all analyses. The degree of missing data across variables included in each of the models was low; the proportion of complete data for each pair of variables ranged from 83 to 95% in the first model, and 83 to 96% in the second. Full information maximum likelihood (FIML) was used to handle missing data. All of the path analytic models that we tested were saturated models with zero degrees of freedom; therefore, we do not report fit statistics for these models.

Hypothesis 1: Replication and Extension of Lamis and Malone (2011) Model

First, we wanted to ensure that we could replicate the findings from Lamis and Malone (2011) in our sample, especially given that we utilized different measures of alcohol-related problems and passive suicide ideation. Additionally, we sought to extend their findings by determining whether alcohol-related problems were associated with the acquired capability constructs of the IPTS. To test the hypotheses that alcohol-related problems would be positively associated with all four IPTS constructs (i.e., thwarted belongingness, perceived burdensomeness, fearlessness about death, and pain tolerance), as well as that the interpersonal constructs (i.e., thwarted belongingness and perceived burdensomeness) would partially mediate the relationships between alcohol-related problems and passive suicide ideation we conducted a path analysis (see Figure 1 for full model). Although in their analyses Lamis and Malone controlled for social desirability and a variety of demographic variables including gender, we did not measure social desirability. Additionally, because none of the other demographic variables that we collected were associated with alcohol-consumption, we only controlled for the effect of gender in this model.

In order to evaluate the above-mentioned hypotheses, we investigated the parameter estimates for all specified direct (Table 3) and indirect (Table 4) paths in the model; these estimates provided partial support for our first set of hypotheses. As expected, there was a significant direct path from alcohol-related problems to thwarted belongingness ($\beta=0.15, p<.02$); the direct path from alcohol-related problems to perceived burdensomeness approached statistical significance ($\beta=0.12, p=.07$). Additionally, there were significant direct paths from both thwarted belongingness ($\beta= 0.24, p<.01$) and perceived burdensomeness ($\beta= 0.28, p<.01$) to passive suicide ideation. Whereas the indirect path from alcohol-related problems to passive suicide ideation through thwarted belongingness ($\beta=0.04, [95\% \text{ CI}=.00-.07], p=.05$), approached statistical significance, the indirect path from alcohol-related problems to passive suicide ideation through perceived burdensomeness ($\beta=0.03, [95\% \text{ CI}= -.02-.08], p=.15$), did not. Although in contrast to those found in Lamis and Malone (2011), the indirect paths in our sample were not statistically significant, the effects were similarly modest in both studies (i.e., in their sample the standardized values for the indirect effects were .08 and .01 for perceived burdensomeness and thwarted belongingness, respectively). Thus, rather than indicating truly discrepant results, the differences in statistical significance of these paths are likely due to our smaller sample size. In sum, the associations among alcohol-related problems, thwarted belongingness, perceived burdensomeness, and passive suicide ideation reported here are similar to those reported by Lamis and Malone (2011).

In the current study we attempted to extend the findings reported by Lamis and Malone (2011) by investigating the relationships between alcohol-related problems, and the acquired capability variables (i.e., fearlessness about death and pain tolerance) of the IPTS. Contrary to our expectations, the direct path from alcohol-related problems to fearlessness about death was

negative and significant ($\beta = -0.14, p = .01$). Additionally, the direct path from alcohol-related problems to pain tolerance was not significant ($\beta = -0.09, p = .12$).

Overall in this model, we accounted for 2% of the variance in perceived burdensomeness, 4% of the variance in thwarted belongingness, 11% of the variance in fearlessness about death, 11% of the variance in pain tolerance, and 22% of the variance in passive suicide ideation. In order to ensure that the inclusion of gender as a covariate was not unduly influencing our results, we reran the model without it. In this version of the model, the pattern and significance of the results remained in line with those reported above with some minor exceptions. Specifically, when gender was not included as a covariate in the model, the direct path from alcohol-related problems to fearlessness about death was reduced to non-significance ($\beta = -0.09, p = .14$), and the percentage of the variances explained in both fearlessness about death and pain tolerance were each reduced to less than one percent.

Hypothesis 2: Determination of differential associations between YAACQ subscales and IPTS constructs

In order to test hypothesis 2 regarding the differential associations among domain-specific types of alcohol-related problems (i.e., the eight YAACQ subscales) and the IPTS constructs, we used Meng, Rosenthal, and Rubins's (1992) test for differences between correlated correlations. This test was used to determine whether alcohol-related problems should be divided into domain specific groupings when investigating their relationships with the IPTS constructs and passive suicide ideation when testing our final path model.

Despite the fact that the results of these analyses indicated some significant differences among subscales, in general, the correlations with the IPTS variables were modest (ranging from $r = -.12$ to $r = .22$). Additionally, rather than highlighting strong relationships between some

specific subtypes of alcohol-related problems and the IPTS constructs, these results indicated that there are some subtypes of problems that have particularly weak relationships with the IPTS constructs. This same pattern of results was found regardless of whether the subscales were scored using the Likert or dichotomous scoring formats. Accordingly, we reasoned that there was little utility in separating alcohol-related problems into separate subscales when investigating their relationships with the IPTS and suicide ideation variables.

Hypothesis 3: A more stringent test of the Lamis and Malone (2011) findings

As noted previously, although alcohol-related problems have been identified as one potential explanatory factor in the relationship between alcohol consumption and suicidal behavior, depressive symptoms and coping motives for drinking have as well. The preliminary results reported above indicate that both sadness and coping motives for drinking had positive zero-order correlations with thwarted belongingness and perceived burdensomeness (see Table 2). In order to ensure that the associations reported in model 1 are not better accounted for by sadness or coping motives for drinking, we ran a second path analytic model, in which these two variables were included as covariates along with gender. In addition to the hypotheses tested in model 1, we expected that in this model there would be a positive and significant correlation between coping motives for drinking and alcohol-related problems. We also expected that there would be positive and significant associations between sadness and thwarted belongingness, perceived burdensomeness, and passive suicide ideation. We did not make a priori predictions regarding the other associations between the covariates and variables included in the model.

Similar to the results of model 1, in this model the direct paths from both thwarted belongingness ($\beta= 0.21, p<.01$) and perceived burdensomeness ($\beta=0.23, p=.03$) to passive suicide ideation were significant. As expected, there was also a positive correlation between

coping motives for drinking and alcohol-related problems ($\beta = 0.55, p < .01$). Similarly, the direct paths from sadness to thwarted belongingness ($\beta = 0.38, p < .01$), perceived burdensomeness ($\beta = 0.49, p < .01$), and passive suicide ideation ($\beta = 0.14, p = .04$), were all significant.

Contrary to our expectations, when coping motives for drinking and sadness were added to the model as covariates, the direct paths between alcohol-related problems and the IPTS variables found in model 1 were reduced to non-significance. Additionally in this model there were no significant direct paths between coping motives for drinking and any of the IPTS variables nor between coping motives for drinking and passive suicide ideation. Neither the indirect paths from alcohol-related problems nor from coping motives to passive suicide ideation through either thwarted belongingness or perceived burdensomeness were significant (see Table 6).

Despite the fact that only gender and sadness had significant associations with any of the IPTS variables, this model accounted for 21% of the variance in thwarted belongingness, 24% of the variance in perceived burdensomeness, 11% of the variance in fearlessness about death, 12% of the variance in pain tolerance, and 23% of the variance in passive suicide ideation. As with model 1, we reran this model without gender included as a covariate. Once again, in this model the general pattern and significance of the results was similar to those reported in detail above with just a few exceptions. Specifically, when gender was not taken into account in this model the direct path from sadness to passive suicide ideation was reduced from significant to approaching significance ($\beta = 0.13, p = .07$), and the percentage of variance explained in both fearlessness about death and pain tolerance was reduced to one percent for each.

Additional Analysis: A more parsimonious path model

Although we had not planned to test a third path model, the surprising results of model two led us to question the utility of including any alcohol-related constructs in the model. In model two it appeared that sadness was likely explaining the majority of the variance in thwarted belongingness and perceived burdensomeness, which appeared to be explaining the majority of the variance in passive suicide ideation in both models one and two. We decided to test these assumptions by running a path analytic model that included only sadness, the IPTS variables, and passive suicide ideation, as well as gender as a covariate.

In this model we found similar significant direct paths as those reported in model 2. Specifically, we found that the direct paths from sadness to thwarted belongingness ($\beta=0.42$, $p<.01$), and from sadness to perceived burdensomeness ($\beta=0.18$, $p<.01$) were significant. We also found that the direct paths from thwarted belongingness ($\beta=0.21$, $p<.01$), and from perceived burdensomeness ($\beta=0.24$, $p=.03$) to passive suicide ideation were significant. Additionally in this model the direct path from sadness to passive suicide ideation approached statistical significance ($\beta=0.12$, $p=.08$). Exactly as was the case in model 2, this model accounted for 21% of the variance in thwarted belongingness, 24% of the variance in perceived burdensomeness, and 23% of the variance in passive suicide ideation. In addition this model accounted for 12% and 9% of the variance in fearlessness about death and pain tolerance, respectively. As with the other models reported above, we reran this model without gender included as a covariate; in this case the pattern and significance of all results remained the same, with only the percentage of variance in both fearlessness about death and pain tolerance changing (each again being reduced to approximately one percent).

Discussion

In this study we examined the relationships between alcohol-related problems, the IPTS variables, and passive suicide ideation. We expanded upon the existing literature in a number of ways. First, whereas in the only other study of the relationship between alcohol-related problems and the IPTS variables in a college student population (i.e., Lamis & Malone, 2011) the authors utilized the construct of suicide proneness as their outcome measure, we used passive suicide ideation as the outcome measure in this study. Second, we included all four of the IPTS constructs in our study in order to investigate whether the experience of alcohol-related problems was associated with not only the desire but also the capability for suicidal behavior. Given that within the past decade researchers interested in alcohol-related problems have posited that there are different kinds of alcohol-related problems, each of which may have unique impacts on a drinkers life (i.e., Perkins, 2002; Read et al., 2006), we also investigated whether these subtypes of alcohol-related problems had differential relationships with the IPTS constructs. Additionally, we tested whether the associations between alcohol-related problems and the interpersonal constructs of the IPTS remained significant when the two conceptually related constructs of coping motives for drinking and sadness were taken into account.

With regards to our first hypothesis, we were largely able to replicate the findings of Lamis and Malone (2011), finding that the direct path from alcohol-related problems to thwarted belongingness was significant and that the direct path from alcohol-related problems to perceived burdensomeness approached significance. Although our results differed in that the indirect paths of alcohol-related problems on passive suicide ideation through perceived burdensomeness and

thwarted belongingness were not significant, the size of these effects were similar across both samples, and thus the differences in significance were likely more associated with sample size than true differences in effects. However, one important difference between the results presented in our model and those presented in Lamis and Malone (2011) is that in their model the direct path from alcohol-related problems to suicide proneness was significant, and in ours the path from alcohol-related problems to passive suicide ideation was not significant. This difference, along with the fact that neither the uni-dimensional nor the multi-dimensional measures of alcohol-related problems in our study had significant zero-order correlations with passive suicide ideation, appear to substantiate our concerns about the suicide proneness construct. Specifically, these discrepant results in the context of otherwise comparable findings seem to suggest that the relationship between suicide proneness and alcohol-related problems found in Lamis and Malone (2011) was likely a reflection of the conceptual similarity between their measures rather than a true relationship. Based on the results of our study it seems unlikely that there is a relationship between alcohol-related problems and suicide ideation in undergraduate students, despite the recent line of research utilizing suicide proneness as an outcome measure (i.e., Lamis & Malone, 2012; Lamis, Malone, & Jahn, in press), that might lead one to assume otherwise.

In our first model we also examined associations between alcohol-related problems and the two components of the acquired capability for suicide: fearlessness about death and pain tolerance. Although in the initial description of the IPTS, Joiner (2005) hypothesized that individuals with alcohol and other substance use problems are at an increased risk of experiencing painful and frightening circumstances and through these circumstances acquiring the capability for suicide, we found no such evidence of this in model one. Although our findings in this model did not support our hypotheses regarding the association between alcohol-related

problems and acquired capability, we recognized that in this particular formulation of the relationship the effects of repeated experience were not captured.

In order to address the above-mentioned issue, as well as to determine whether subtypes of alcohol-related problems had differential associations with each of the IPTS constructs, we tested our second hypothesis. In general, we had anticipated that when the eight subscales of the YAACQ, each of which measures alcohol-related problems associated with a particular life domain, were measured on a frequency scale, distinct relationships between some of these subscales and the IPTS constructs would emerge. Contrary to our expectations, the results of this analysis indicated that in general alcohol-related problems of all types were modestly positively correlated with both thwarted belongingness and perceived burdensomeness, and were not correlated with fearlessness about death or physical pain tolerance. This was the case regardless of whether the subtypes of alcohol-related problems were scored dichotomously or on a frequency scale. We draw two conclusions from these findings. First, these results indicate that the kinds of alcohol-related problems measured on the YAACQ are not related to the components of the acquired capability for suicide. Secondly, they suggest that, at least when it comes to predicting the variables included in our model, there was little utility in differentiating among subtypes of alcohol-related problems.

Finally, in order to examine differential associations between alcohol-related problems and the IPTS constructs when coping motives for drinking and sadness are taken into account, we ran a second path model in which we included both of these constructs as covariates. Contrary to our hypotheses, in this model the direct paths from alcohol-related problems were reduced to non-significance, and only the paths from sadness to thwarted belongingness, perceived burdensomeness, and passive suicide ideation, as well as those from gender to

thwarted belongingness and the acquired capability constructs, remained significant. As a further test of the impact of any of the alcohol-related variables on the IPTS constructs and passive suicide ideation, we conducted a third path analysis in which only sadness and gender were included as exogenous variables. In this model we found that nearly the exact same amount of variance was explained in each of the endogenous variables, a finding that we interpret as additional evidence that the alcohol-related constructs did not have a significant impact beyond that accounted for by sadness.

In sum our findings suggest that there are modest relationships between alcohol-related problems and the interpersonal constructs of the IPTS, but these relationships appear spurious and better accounted for by recent experiences of sadness. Additionally, whereas other authors (i.e., Lamis & Malone, 2011) have found a relationship between alcohol-related problems and the construct of suicide proneness, the lack of an association found in our study between alcohol-related problems and passive suicide ideation suggests that suicide proneness is capturing a different construct. Although both the IPTS and recent research on alcohol-related problems would predict differential associations between IPTS constructs and subtypes of alcohol-related problems, our findings suggest that for at least those alcohol-related problems captured on the YAAC-Q (Read et al., 2006), there are modest associations between all subtypes of alcohol-related problems and thwarted belongingness and perceived burdensomeness but not the acquired capability constructs. Lastly, our results support the main tenets of the IPTS: we found that perceived burdensomeness and thwarted belongingness have the strongest relationships with passive suicide ideation, beyond that explained by sadness alone.

Despite what this study adds to the literature, it has several limitations. Most importantly, the fact that our sample consisted of generally well-adjusted college students may have limited

our ability to find effects. Specifically, the severe restriction of range in the thwarted belongingness, perceived burdensomeness, and passive suicide ideation variables in our sample does not allow us to speak to the relationships that could exist between these and the alcohol-related variables at higher levels of the thwarted belongingness, perceived burdensomeness, and passive suicide ideation constructs. In contrasting our study with those that have found significant relationships between alcohol-related constructs and suicidal behavior in college student populations (e.g., Gonzalez, Bradizza, & Collins, 2009; Gonzalez, Collins, & Bradizza, 2009), our choice to not recruit specifically for lifetime experiences of passive suicide ideation clearly resulted in a less pathological, but likely more generalizable, sample of undergraduate students. At the same time, we were able to capture a wide range within the alcohol consumption, alcohol-related problems, and coping motives for drinking variables in our sample, which suggests that there is not a strong association between variation in these constructs and the IPTS constructs nor passive suicide ideation. Again while this suggests the lack of a relationship between these constructs in a generally well-functioning sample of college students, the findings from our study cannot be generalized to more severe samples, such as those with an AUD who may experience severe physical and interpersonal consequences (e.g., hospitalization, homelessness, job loss, divorce, jail time, etc.) as a result of their drinking (e.g., You, Van Orden, and Conner, 2011).

Another notable limitation is that our data were collected cross-sectionally. As others have expressed, although such design can be helpful in determining the existence of relationships among variables, causal inferences cannot be drawn from a study carried out through such methods. Given that we viewed our study as a first step in determining the existence and relative strength of relationships among all IPTS variables and alcohol related variables, such a design

was warranted. Considering the fact that we found recent experiences of sadness to have the most robust relationships with the IPTS and passive suicide ideation variables, future research should attempt to distinguish the causal order of these variables. Our results cannot speak to whether alcohol-related problems had a causal role in the sadness that students reported, or whether coping motives for drinking were endorsed in response to current feelings of sadness. To determine the temporal order in which these constructs may be emerging, and particularly whether they relate to each other in a causal manner, more sophisticated methods are needed.

A final limitation is that we did not measure the construct of suicide proneness in our sample. With this in mind, we cannot say for certain that the significant associations between alcohol-related problems and suicide proneness found by Lamis and Malone (2011) was due to the overlap between the two constructs. These differences also could have reflected general differences between our samples; while the similar findings regarding all other relationships between their model and ours, as well as similar demographics of the two samples makes this explanation unlikely, at this point it remains an empirical question. In the future researchers ought to measure both suicide proneness and passive suicide ideation, so that it will be possible to determine how each relates to other relevant constructs.

Despite the above-mentioned limitations, this study contributes to the literature in three distinct ways. As the first study to investigate the relationships among all four IPTS constructs and specific subtypes of alcohol-related problems, we provide a rigorous test of the hypotheses initially proposed in the first articulation of the IPTS (Joiner, 2005), regarding the impacts of the negative experiences triggered by substance use on an individual's desire and capability for suicide. Our findings do not support the specificity of the effects of alcohol-related problems on each of the IPTS components, but rather suggest that there are modest relationships among all

types of alcohol-related problems and the IPTS constructs associated with suicidal desire. However, these relationships can best be captured by recent experiences of sadness. Another important contribution is that this is the first study to investigate the utility of distinguishing among subtypes of alcohol-related problems when relating them to suicidal behavior. The fact that all subtypes were highly correlated with one another, and had similar relationships with all other variables in our model suggests that little relevant information is gained by dividing problems into these subscales. Rather, our findings support the use of a brief, dichotomously scored alcohol-related problems measure (i.e., the B-YAACQ, Khaler et al., 2005) when investigating these kinds of relationships among undergraduate students. This measure captured the same kinds of relationships as did the full scale, and frequency scored versions of the measure, while proving less demanding for participants, and utilizing a user-friendly scoring format. Finally, this study provided additional support for the IPTS, given that we consistently found strong, theoretically predicted relationships among thwarted belongingness, perceived burdensomeness, and suicide ideation. These findings suggest that, within a group of regular drinking undergraduate students, thwarted belongingness and perceived burdensomeness have the strongest associations with passive suicide ideation.

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Appendix A: Tables

Table A1

Descriptive Statistics for all Variables for Regular Drinking Sample.

	Mean	Std. Dev.	Min.	Max.	Skew	Kurtosis	Total N
Variable							295
Age	20.60	1.68	19.00	31.00	1.97	6.78	293
Year in school	2.91	1.16	1.00	5.00	-0.02	-0.90	295
Total drinks	29.41	26.18	4.00	115.28	1.67	2.70	279
Alcohol-related problems (YAACQ, Frequency scale)	33.49	27.31	0.00	90.00	0.87	-0.38	279
SOC	4.99	3.93	0.00	22.00	1.19	1.55	279
SELF-P	2.54	2.94	0.00	13.00	1.41	1.62	280
SELF-C	4.36	5.34	0.00	31.00	1.93	4.76	280
ACC-OCC	2.15	2.68	0.00	12.00	1.64	2.75	280
RISK	3.99	4.27	0.00	21.00	1.43	0.15	280
BLKOUT	7.30	5.86	0.00	28.00	0.98	0.44	280
PHYS-DEP	1.18	1.88	0.00	10.00	2.38	6.18	280
CONTR	4.44	4.35	0.00	24.00	1.50	2.45	280
B-YAACQ	11.25	6.35	0.00	24.00	0.18	-0.97	280
TB	0.98	1.02	0.00	4.07	1.22	0.77	274
PB	0.20	0.51	0.00	2.14	2.91	7.61	275
FAD	21.48	6.44	7.00	35.00	0.03	-0.44	276
Pain tolerance	29.34	6.87	9.00	49.00	-0.18	-0.07	274
P-SI	0.19	0.54	0.00	2.63	3.05	8.82	260
Coping motives	8.79	3.64	5.00	20.43	1.33	1.52	283
Conformity motives	6.98	2.50	5.00	14.73	1.35	1.04	283
Social motives	16.52	4.59	5.00	25.00	-0.07	-0.91	283
Enhancement motives	13.92	4.66	5.00	25.00	0.29	-0.65	283
Sadness	0.69	0.77	0.00	3.00	1.04	0.84	264

Note. YAACQ= Young Adult Alcohol Consequences Questionnaire; SOC= social problems subscale; SELF-P= self-perception subscale; SELF-C= self-care subscale; ACC-OCC= academic/ occupational subscale; RISK= risky behavior subscale; BLKOUT= blackout subscale; PHYS-DEP= physical-dependence subscale; CONTR=impaired control subscale; B-YAACQ= Brief Young Adult Alcohol Consequences Questionnaire; FAD= fearlessness about death; TB= thwarted belongingness; PB= perceived burdensomeness; P-SI= passive suicide ideation.

Table A2

Zero-Order Correlations between Study Variables in Regular Drinking Sample.

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1. Gender	1																					
2. Conformity Motives	-.04	1																				
3. Coping Motives	-.06	.44*	1																			
4. Social Motives	-.08	.42*	.60*	1																		
5. Enhancement Motives	-.20*	.22*	.53*	.68*	1																	
6. Sadness	.04	.29*	.37*	.24*	.18*	1																
7. Total Drinks	-.32*	.16*	.33*	.34*	.38*	.06	1															
8. B-YAACQ	-.09	.41*	.53*	.46*	.40*	.31*	.38*	1														
9. TB	-.14*	.20*	.26*	.15*	.07	.42*	.01	.18*	1													
10. PB	-.05	.20*	.17*	.09	.07	.48*	-.01	.15*	.55*	1												
11. Pain Tolerance	-.33*	-.12	-.05	-.02	.05	-.11	.03	-.07	.05	-.07	1											
12. FAD	-.30*	-.14*	-.12*	-.10	-.05	-.05	-.05	-.10	.11	.01	.32*	1										
13. P-SI	-.13*	.07	.10	.06	.03	.32*	-.03	.10	.40*	.42*	.01	.12	1									
14. YAACQ-BLKOUT	-.13*	.33*	.40*	.48*	.41*	.21*	.42*	.82*	.09	.10	.04	-.01	.07	1								
15. YAACQ-RISK	-.15*	.40*	.45*	.44*	.41*	.24*	.33*	.86*	.14*	.17*	.03	-.06	.04	.81*	1							
16. YAACQ-SELF-C	-.07	.38*	.50*	.40*	.33*	.25*	.36*	.81*	.15*	.10	-.04	-.04	.09	.69*	.75*	1						
17. YAACQ-SELF-P	-.05	.40*	.37*	.24*	.15*	.28*	.16*	.74*	.22*	.15*	-.12	-.11	.10	.59*	.69*	.74*	1					
18. YAACQ-ACC-OCC	-.02	.35*	.50*	.37*	.32*	.27*	.30*	.83*	.15*	.15*	-.08	-.08	.12	.69*	.74*	.79*	.67*	1				
19. YAACQ-PHYS-DEP	-.16*	.23*	.44*	.36*	.35*	.20*	.35*	.74*	.20*	.15*	-.01	-.01	.06	.65*	.67*	.57*	.52*	.59*	1			
20. YAACQ-SOC	-.05	.38*	.43*	.46*	.37*	.24*	.29*	.82*	.15*	.13*	-.01	-.01	.03	.80*	.82*	.71*	.72*	.70*	.62*	1		
21. YAACQ-CONTR	-.06	.39*	.52*	.42*	.38*	.26*	.35*	.84*	.15*	.16*	-.02	-.02	.06	.77*	.80*	.81*	.74*	.73*	.66*	.78*	1	

Note. B-YAACQ= Brief Young Adult Alcohol Consequences Questionnaire; TB=thwarted belongingness; PB= perceived burdensomeness; FAD= fearlessness about death; P-SI= passive suicide ideation; YAACQ= Young Adult Alcohol Consequences Questionnaire; BLKOUT= blackout subscale; RISK= risky behavior subscale; SELF-C= self-care subscale; SELF-P= self-perception subscale; ACC-OCC= academic/ occupational subscale; PHYS-DEP= physical-dependence subscale; SOC= social problems subscale; CONTR=impaired control subscale. *= $p < .05$.

Table A3

Standardized and Unstandardized Parameter Estimates for Path Model 1.

Parameter Estimated	B	(SE)	t	β	p
P-SI on					
TB	0.12	0.05	2.53	0.24	<.01
PB	0.29	0.12	2.50	0.28	<.01
Alcohol-related Problems	0.00	0.00	-0.12	-0.01	.90
Gender	-0.08	0.06	-1.30	-0.08	.19
PB on					
Alcohol-related Problems	0.01	0.01	1.76	0.12	.07
Gender	-0.03	0.06	-0.43	-0.03	.67
TB on					
Alcohol-related Problems	0.02	0.01	2.34	0.15	.02
Gender	-0.25	0.12	-2.07	-0.12	.04
FAD on					
Alcohol-related Problems	-0.15	0.06	-2.55	-0.14	.01
Gender	-4.22	0.75	-5.61	-0.33	.00
Pain Tolerance on					
Alcohol-related Problems	-0.10	0.06	-1.56	-0.09	.12
Gender	-4.70	0.79	-5.98	-0.34	<.01
PB with					
TB	0.27	0.06	4.92	0.54	<.01
FAD	0.04	0.22	0.16	0.01	.87
Pain Tolerance	-0.24	0.19	-1.28	-0.07	.19
TB with					
FAD	0.58	0.39	1.47	0.10	.13
Pain Tolerance	0.11	0.36	0.30	0.02	.77
FAD with					
Pain Tolerance	9.28	2.56	3.62	0.24	<.01
Alcohol-related Problems with					
Gender	-0.53	0.18	-2.88	-0.17	<.01

Note. Gender coded as male=0, female =1. P-SI= passive suicide ideation. TB= thwarted belongingness; PB= perceived burdensomeness; FAD= fearlessness about death.

Table A4

Indirect Effects in Path Model 1.

Effect Tested	Estimate (95% CI)	Standardized Estimate (95% CI)	p
Alcohol related problems on P-SI through TB	0.00 (0.00-0.01)	0.04 (-0.00-0.07)	.05
Alcohol related problems on P-SI ideation through PB	0.00 (0.00-0.01)	0.03(-0.02-0.08)	.15

Note. P-SI= passive suicide ideation. TB= thwarted belongingness; PB= perceived burdensomeness.

Table A5

Standardized and Unstandardized Parameter Estimates for Path Model 2.

Parameter Estimated	B	(SE)	t	β	p
P-SI on					
TB	0.11	0.05	2.33	0.21	<.01
PB	0.24	0.12	2.06	0.23	.03
Alcohol-related Problems	0.00	0.01	-0.03	0.00	.98
Gender	-0.10	0.07	-1.51	-0.09	.13
Sadness	0.10	0.05	2.04	0.14	.04
Coping Motives	-0.01	0.01	-0.63	-0.05	.53
PB on					
Alcohol-related Problems	0.00	0.01	-0.18	-0.01	.85
Gender	-0.07	0.06	-1.20	-0.06	.23
Sadness	0.33	0.06	5.54	0.49	<.01
Coping Motives	0.00	0.01	-0.07	-0.01	.95
TB on					
Alcohol-related Problems	0.00	0.01	-0.28	-0.02	0.78
Gender	-0.32	0.11	-2.94	-0.16	<.01
Sadness	0.51	0.09	5.44	0.38	<.01
Coping Motives	0.03	0.02	1.47	0.11	.15
FAD on					
Alcohol-related Problems	-0.10	0.07	-1.43	-0.10	.15
Gender	-4.18	-0.74	-5.70	-0.32	<.01
Sadness	0.11	0.59	0.19	0.01	.85
Coping Motives	-0.14	0.12	-1.19	-0.08	.24
Pain Tolerance on					
Alcohol-related Problems	-0.07	0.07	-0.10	-0.07	.32
Gender	-4.61	0.79	-5.87	-0.32	<.01
Sadness	-0.67	0.62	-1.08	-0.07	.85
Coping Motives	0.00	0.13	-0.03	0.00	.24
PB with					
TB	0.18	0.04	4.75	0.43	<.01
FAD	0.04	0.18	0.21	0.01	.84
Pain Tolerance	-0.13	0.17	-0.77	-0.04	.44
TB with					
FAD	0.61	0.33	1.88	0.11	.06
Pain Tolerance	0.30	0.33	0.91	0.05	.37
FAD with					
Pain Tolerance	9.28	2.54	3.66	0.24	<.01
Alcohol-related Problems with					
Gender	-0.52	0.18	-2.82	-0.17	<.01

(continued)

Parameter Estimated	B	(SE)	t	β	p
Sadness	1.29	0.31	4.16	0.27	<.01
Coping Motives	12.71	1.46	8.73	0.55	<.01
Gender with					
Sadness	0.01	0.02	0.50	0.03	.62
Coping Motives	-0.14	0.11	-1.29	-0.07	.20
Sadness with					
Coping Motives	0.99	0.22	4.52	0.36	<.01

Note. Gender coded as male=0, female=1. P-SI= passive suicide ideation; TB= thwarted belongingness; PB= perceived burdensomeness; FAD= fearlessness about death.

Table A6

Indirect Effects in Path Model 2.

Effect Tested	Estimate (95% CI)	Standardized Estimate (95% CI)	p
Alcohol related problems on P-SI through TB	0.00 (0.00-0.00)	0.00 (-0.07-0.05)	.78
Alcohol related problems on P-SI through PB	0.00 (0.00-0.00)	0.00 (-0.04-0.03)	.85
Coping motives on P-SI through TB	0.00 (0.00-0.01)	0.02 (-0.01-0.06)	.17
Coping motives on P-SI through PB	0.00 (-0.01-0.01)	0.00 (-0.04-0.04)	.95

Note. P-SI= passive suicide ideation. TB= thwarted belongingness; PB= perceived burdensomeness.

Table A7

Standardized and Unstandardized Parameter Estimates for Path Model 3.

Parameter Estimated	B	(SE)	t	β	p
P-SI on					
TB	0.11	0.05	2.31	0.21	<.01
PB	0.25	0.12	2.10	0.24	.03
Sadness	0.09	0.05	1.75	0.12	.08
Gender	-0.09	0.06	-1.45	-0.09	.15
PB on					
Sadness	0.32	0.06	5.65	0.48	<.01
Gender	-0.06	0.05	-1.12	-0.06	.26
TB on					
Sadness	0.56	0.09	6.48	0.42	<.01
Gender	-0.33	0.11	-2.96	-0.16	<.01
FAD on					
Sadness	-0.37	0.56	-0.66	-0.04	.51
Gender	-3.87	0.73	-5.29	-0.30	<.01
Pain Tolerance on					
Sadness	-0.84	0.60	-1.41	-0.09	.16
Gender	-4.44	0.77	-5.78	-0.32	<.01
PB with					
TB	0.18	0.04	4.81	0.43	<.01
FAD	0.05	0.18	0.27	0.02	.79
Pain Tolerance	-0.12	0.16	-0.77	-0.04	.45
TB with					
FAD	0.55	0.34	1.66	0.10	.09
Pain Tolerance	0.28	0.33	0.86	0.05	.39
FAD with					
Pain Tolerance	9.63	2.57	3.75	0.24	<.01
Gender with					
Sadness	0.01	0.02	0.44	0.03	.66

Note. Gender coded as male=0, female =1. P-SI= passive suicide ideation. TB= thwarted belongingness; PB= perceived burdensomeness; FAD= fearlessness about death.

Appendix B: Figure

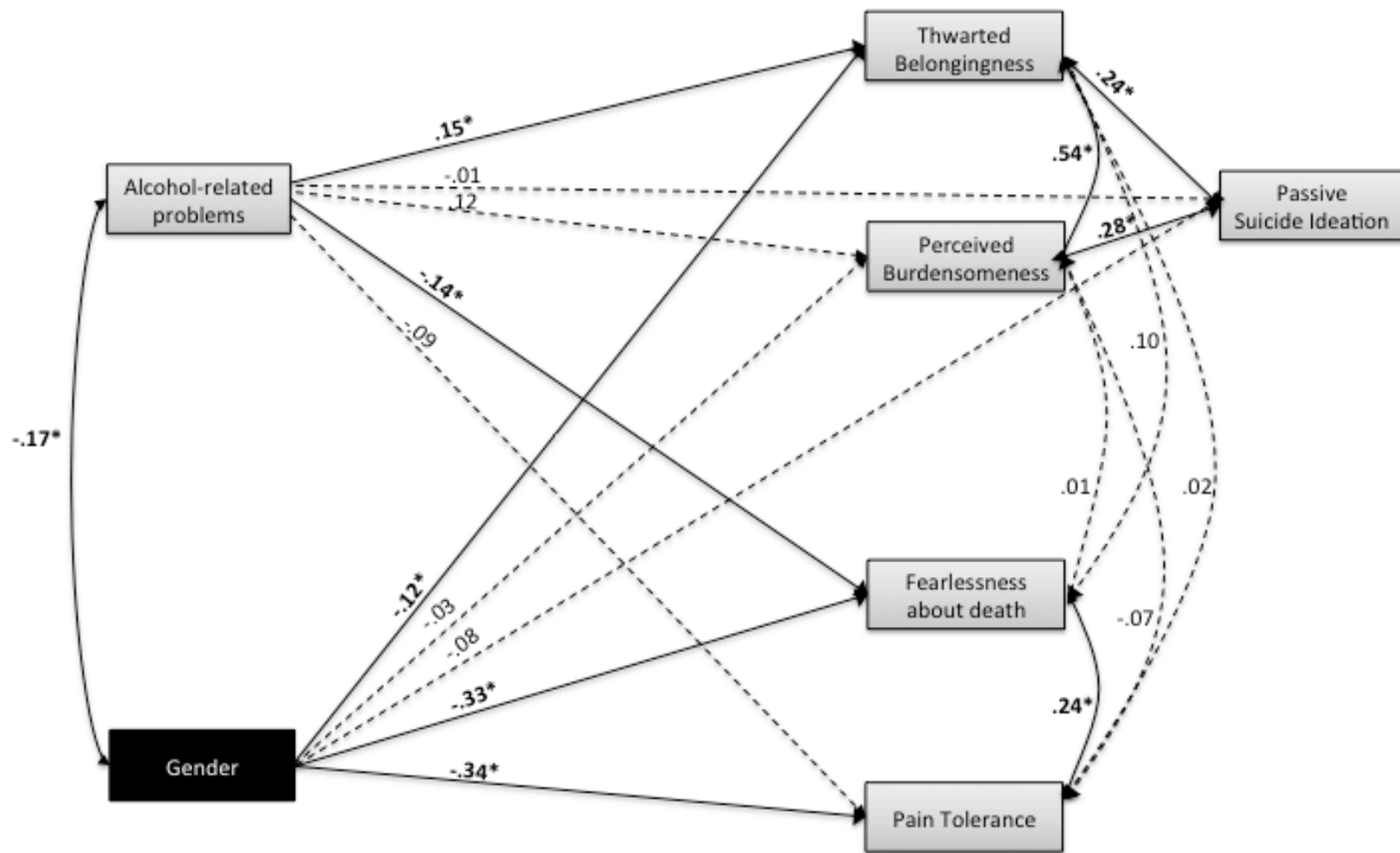


Figure B1. Path Model 1. Relationships among alcohol-related problems, IPTS variables, and passive suicide ideation, while

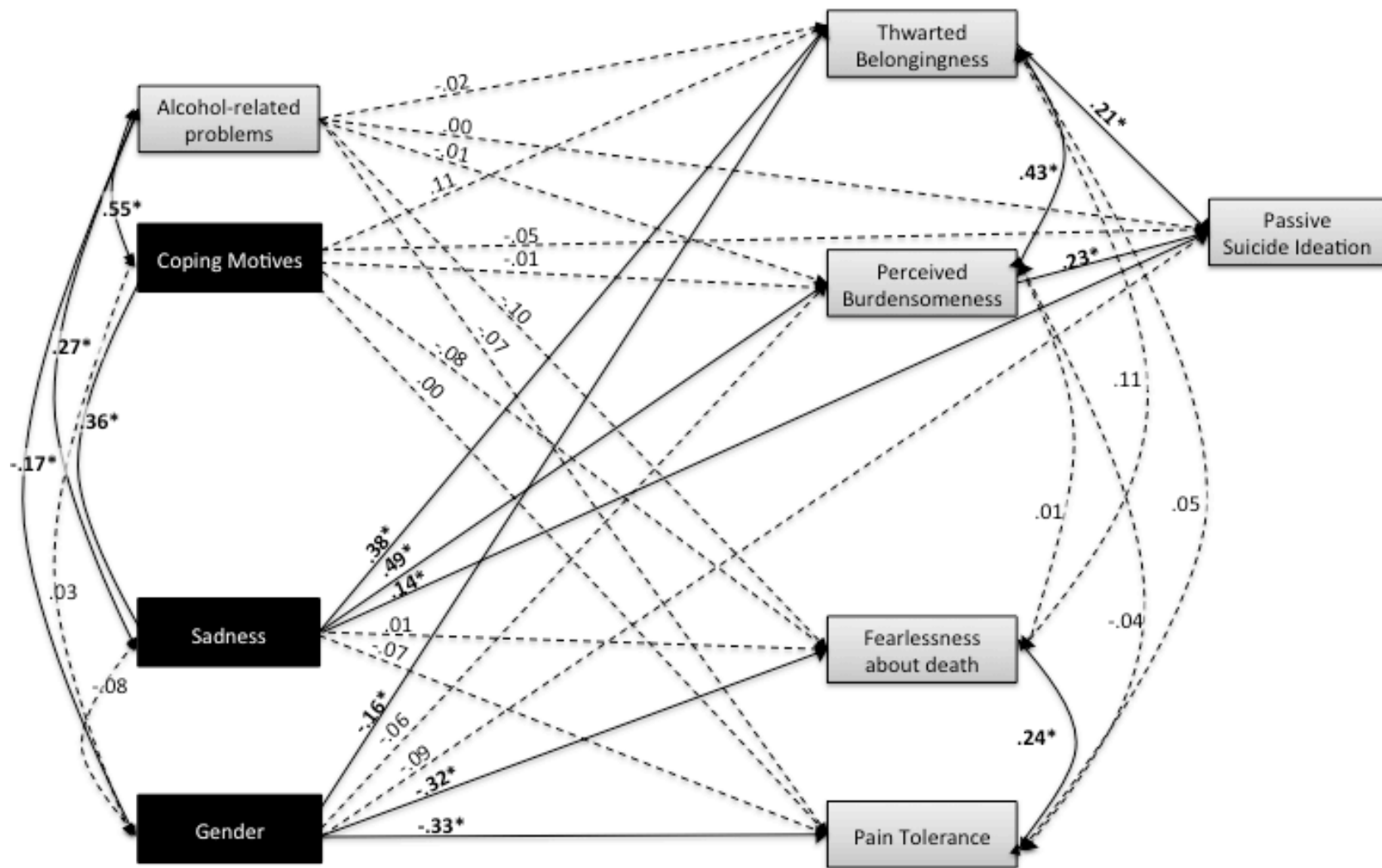


Figure B2. Path Model 2. Relationships among alcohol-related problems, IPTS variables, and passive suicide ideation, while controlling for gender, coping motives for drinking, and sadness (control variables denoted in black). *= $p < .05$.

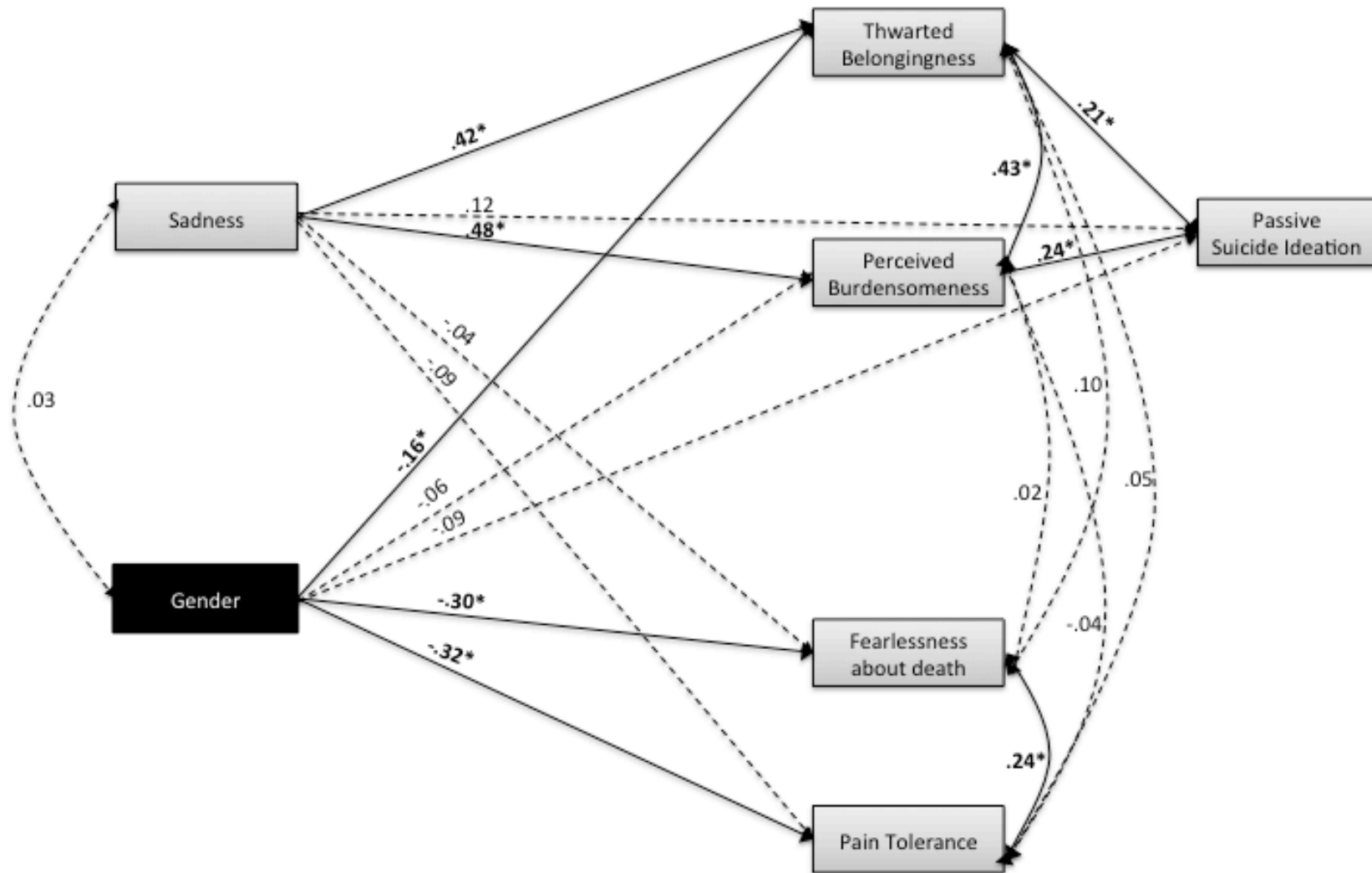


Figure B3. Path Model 3. Relationships among sadness, IPTS variables, and passive suicide ideation, while controlling for gender (control variables denoted in black). *=p<.05.