

ORIGINAL ARTICLE

## Differential associations among alcohol use, depression and perceived life meaning in male and female college students

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### Abstract

Excessive alcohol consumption is a chronic issue on college campuses nationwide and presents a significant public health concern. Compared with non-college peers, college students consume alcohol at substantially higher rates and encounter more negative consequences resulting from drinking. This study aimed to examine the role of depression and perceived life meaning in college student drinking, with a focus on potential sex differences. Participants recruited from a large southern university in the United States (mean age = 19.14, SD age = 2.05; 75.7% female; 75.7% Caucasian, 17.2% African American) completed surveys assessing perceived meaning, depression and alcohol use. Results indicated a significant inverse relationship between perceived meaning and alcohol use, while no significant association was found between depression and alcohol use. Although the regression model including perceived meaning and depression was significant in the prediction of alcohol use, it was meaning that accounted for significant variance in alcohol use. When the sample was split by sex, there was an interaction between meaning and depression in predicting male alcohol use. This study expands upon previous research pertaining to college student alcohol use and reveals potentially clinically relevant differences in patterns of association between men and women. Limitations, clinical implications and directions for research are discussed.

**Keywords:** *Alcohol, drinking (drinkers), motivation.*

### Introduction

Heavy alcohol use is a common occurrence on college campuses. A national survey conducted by the Substance Abuse and Mental Health Services Association (SAMHSA, 2010) revealed that among college students aged 18–22 (enrolled full time), 63.9% had consumed at least one drink in the last month, 43.5% had consumed five or more drinks

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during one occasion at least once in the past month and 16.0% had consumed five or more drinks on one occasion five or more times in the last month. For same-age peers not enrolled in college, the respective percentages were lower at 53.5, 37.8 and 11.7 (SAMHSA, 2010).

Alcohol-related negative consequences are further cause for concern. According to a series of studies compiling national public morbidity and mortality records involving college students (Hingson et al., 2005, 2009), in 2005 there were approximately 1800 unintentional injury deaths, 600,000 reported injuries, 696,000 reported acts of violence/assault and 97,000 date rapes or sexual assaults linked to alcohol consumption. Despite national recognition and widespread intervention efforts, no corresponding declines in excessive drinking and negative consequences have followed (Wechsler et al., 2002; Hingson et al., 2009; SAMHSA, 2010).

Of the motivations linked to college student drinking, those involving coping are worthy of increased scrutiny since they tend to be more strongly associated with harmful alcohol-related consequences (Park & Levenson, 2002; Martens et al., 2008). In terms of coping, college students may drink to escape from, avoid or otherwise regulate unpleasant symptoms related to depression and perceived meaninglessness (Wood et al., 1992; Camatta & Nagoshi, 1995; Lecci et al., 2002). Besides their implications with alcohol use, depression and meaning tend to be inversely correlated with one another (e.g. Steger et al., 2009).

Depression is a widespread problem for college students. A recent national survey in the United States indicated that nearly 30% reported feeling “so depressed it was difficult to function” in the past 12 months (American College Health Association, 2009). Although major depressive disorder and alcohol abuse are correlated in the general population (Grant et al., 2009), research findings are mixed regarding the extent to which depression is implicated in college student drinking (Cranford et al., 2009; Pedrelli et al., 2011). Among college students, depression is associated with alcohol-related problems (e.g. academic issues and trouble with authorities) but not alcohol use alone (Camatta & Nagoshi, 1995; Nagoshi, 1999; Martens et al., 2008).

The extent to which one pursues personally meaningful values and goals has also been implicated in college student drinking. Frustrations in one’s search for meaning may be related to maladaptive methods of coping such as substance use (Frankl, 1959/1985; Schulenberg et al., 2008). College students reporting perceptions of life as meaningless tend to drink more frequently and experience more negative consequences from drinking. For example, Newcomb and Harlow (1986) demonstrated a partial mediational role of meaning in life in the relation between uncontrollable life stress and substance use. Likewise, college students who report lower meaning derived from valued life goals were more likely to drink heavily and endorsed more alcohol-related negative consequences (Palfai & Weafer, 2006; Palfai et al., 2011). Lecci et al. (2002) revealed that the pursuit of meaningful goals was associated with less frequent drinking; further, distress resulting from conflict surrounding life goals was associated with coping motivations for drinking, which were predictive of alcohol-related problems.

While depression and meaninglessness are each relevant to college students and have been correlated with hazardous alcohol consumption, inconsistencies exist when samples are examined separately by sex (e.g. Orcutt, 1984; Harlow et al., 1986; Kinnier et al., 1994; Newcomb et al., 1999; Harrell & Karim, 2008). Since some studies find depression and/or perceived meaning to be significant correlates for men and women, while others do not, continued research is warranted. Given that men and women tend to drink different amounts and are physically affected by alcohol differently (e.g. DeMartini & Carey, 2009), that men and women report somewhat different motivations for drinking (e.g. Harrell & Karim,

2008) and that men report more frequent drinking to cope (Park & Levenson, 2002), sex differences in the role of depressed mood and perceived meaning should be investigated.

This study examined the role of depression and lack of perceived meaning/purposeful goals in college students, examining the sample overall, as well as split by sex. Based on the existing literature, the following hypotheses were offered: (1) Men will report more hazardous alcohol use as shown by an independent samples *t*-test; (2) depression and perceived meaning will be negatively correlated with separate patterns of effects by sex; (3) depression and alcohol use will be positively correlated with separate patterns of effects by sex; (4) perceived meaning and alcohol use will be negatively correlated with separate patterns of effects by sex; and (5) depression, perceived meaning and their interaction will be used to significantly predict alcohol use overall and separately for men and women using hierarchical regression analyses.

## Method

### *Participants*

Participants were recruited from a large university in the southeast region of the United States, via an online system employed as a means to sign up for experimental studies. Course credit was awarded for participation. Participants included 267 students (mean age = 19.14, SD age = 2.05; 75.7% female; 75.7% Caucasian, 17.2% African American).

## Materials

### *Purpose in Life Test – Short Form*

The Purpose in Life Test – Short Form (PIL-SF) (Schulenberg & Melton, 2010; Schulenberg et al., 2011) contains four items extracted from the original, 20-item measure (Crumbaugh & Maholick, 1964, 1969). Items assess perceived life meaning and purposeful goals using a 7-point Likert-type response format. Scores range from 4 to 28, with higher scores suggestive of greater perceived meaning/purpose in life (mean = 22.67, SD = 3.73; Schulenberg et al., 2011). In this study, PIL-SF scores averaged 23.33 (SD = 3.06), with a coefficient  $\alpha$  of 0.79.

### *Center for Epidemiological Studies – Depression scale*

The Center for Epidemiological Studies – Depression (CES-D) scale (Radloff, 1977) contains 20 items assessing symptoms of depression using a response format ranging from 0 to 3, with 0 = *rarely or none of the time*; 3 = *most or all of the time*. Scores range from 0 to 60 and higher scores suggest greater depression. In this study, scores averaged 13.20 (SD = 9.41) with a Cronbach's  $\alpha$  of 0.89.

### *Alcohol Use Disorders Identification Test*

The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item screener assessing frequency and amount of alcohol consumption as well as hazardous and excessive drinking behaviours (Babor et al., 2001). Scores on the AUDIT range from 0 to 40 and higher scores indicate more hazardous alcohol use (Saunders et al., 1993). The manual suggests a cutoff value of 8 points to maximize sensitivity and specificity with regard to hazardous drinking (Babor et al., 2001). In this study, AUDIT scores averaged 7.21 (SD = 5.76) with a coefficient  $\alpha$  of 0.85.

## Procedures

This study was approved by the university's Institutional Review Board and all participants gave informed consent. Data collection packets were provided during a number of group sessions that occurred weekly over the course of one semester. Packets included the materials described above, along with other measures required for a larger study of which this investigation was a part. Measures were counterbalanced to account for potential order effects. Completion time for the packet was approximately 45 minutes.

## Results

Data were screened for assumptions of correlation and regression and found to be satisfactory, and outlier analyses showed no effect of potential deviant scores. Table I shows overall, men and women averages (SDs) for each scale. As predicted by the first hypothesis, men reported higher levels of alcohol use than women using an independent samples *t*-test,  $t(265) = 2.96, p = 0.003$ .

### *Correlational analysis*

In the sample overall, a significant relationship was found between perceived meaning and alcohol use ( $r = -0.17, p = 0.006$ ), indicating that higher meaning scores were related to lower alcohol use scores. However, there was no significant relationship between the depression and alcohol use scores ( $r = 0.09, p = 0.13$ ). As expected, a significant negative relationship between perceived meaning and depression was found ( $r = -0.39, p < 0.001$ ). For women, there was a strong relationship between perceived meaning and depression ( $r = -0.47, p < 0.001$ ), while men did not show a significant relationship ( $r = -0.10, p = 0.45$ ). Women also showed a significant relationship between alcohol use and perceived meaning ( $r = -0.14, p = 0.047$ ), and while the correlation coefficient for men was higher, it was not significant ( $r = -0.18, p = 0.15$ ). For women, as perceived meaning increases, both depression and alcohol use decrease. Neither sex displayed a significant direct relationship between depression and alcohol use (female  $r = 0.12, p = 0.08$ , male  $r = 0.05, p = 0.70$ ).

### *Regression analyses*

Perceived meaning was negatively related to both alcohol use and depression, while depression and alcohol use were not directly related with differential effects for sex. This pattern implies an interaction between variables, which was tested with regression analyses. A hierarchical regression was conducted using perceived meaning, depression and their interaction to predict alcohol use. The individual variables were centred and entered in the first step of the regression equation to look at their prediction of alcohol use. Overall, the regression model was significant,  $F(2, 264) = 3.92, R^2 = 0.03$ , but this effect was due to the PIL-SF scores significantly predicting alcohol use,  $\beta = -0.15, t(264) = -2.34, p = 0.02$ . The CES-D did not significantly predict alcohol use overall,  $\beta = -0.03, t(264) = 0.50, p = 0.62$ . The interaction was added into the second step of the model, which was not significant,  $\Delta F(1, 263) = 1.90, p = 0.17$ .

These analyses were also broken down by sex to examine differences between male and female predictors. Although women showed significant relationships between depression, perceived meaning and alcohol use, neither depression nor perceived meaning significantly

Table I. Mean scores and standard deviations for depression, meaning in life and alcohol use

	Men	Women	Total
CES-D	12.28 (7.96)	13.50 (9.82)	13.20 (9.41)
PIL-SF	22.66 (2.64)	23.55 (3.16)	23.33 (3.06)
AUDIT	8.63 (6.29)	6.22 (5.54)	7.21 (5.76)

Note: CES-D, Center for Epidemiological Studies – Depression Scale; PIL-SF, Purpose in Life test – Short Form; AUDIT, Alcohol Use Disorders Identification Test.

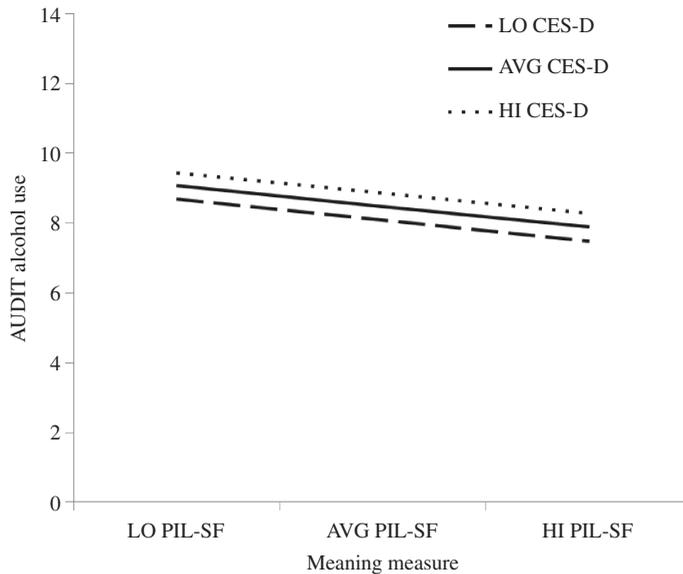


Figure 1. This figure portrays low ( $-1$  SD, mean = 3.68), average (mean = 13.50) and high ( $+1$  SD, mean = 23.32) female depression scores and their lack of interaction with meaning in life predicting alcohol scores.

Note: CES-D, Center for Epidemiological Studies – Depression scale; PIL-SF, Purpose in Life test – Short Form; AUDIT, Alcohol Use Disorders Identification Test.

predicted alcohol use,  $F(2, 199) = 2.42$ ,  $p = 0.09$ ,  $R^2 = 0.02$ . Further, the addition of the interaction term did not increase prediction ability,  $\Delta F < 1$ ,  $p = 0.98$ , and this lack of interaction is shown in Fig. 1. The male regression equation portrayed a surprisingly different pattern of results. The first step of the hierarchical regression showed that depression and perceived meaning did not individually predict alcohol use,  $F(2, 62) = 1.10$ ,  $p = 0.34$ ,  $R^2 = 0.03$ . However, the interaction between depression and perceived meaning was a significant predictor in the second step of the regression model,  $\Delta F(1, 61) = 5.19$ ,  $p = 0.03$ ,  $\Delta R^2 = 0.08$ . At average levels of depression, male participants showed a marginal negative relationship between perceived meaning and alcohol use,  $\beta = -0.21$ ,  $t(61) = -1.70$ ,  $p = 0.09$ . Figure 2 displays this interaction.

As a *post hoc* examination, high depression (1 SD above the mean) and low depression (1 SD below the mean) male groups were coded and tested in hierarchical regressions. For the low depression group, a very strong negative relationship between meaning and alcohol use was found,  $\beta = -2.69$ ,  $t(61) = -2.43$ ,  $p = 0.02$ . For the high depression

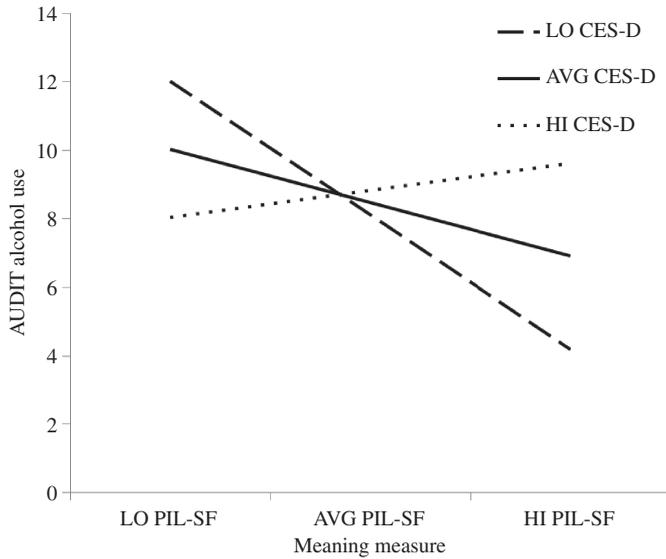


Figure 2. Interaction between meaning and depression predicting alcohol use for male participants in low (mean = 4.32), average (mean = 12.28) and high (mean = 20.24) depression groups.

Note: CES-D, Center for Epidemiological Studies – Depression Scale; PIL-SF, Purpose in Life test – Short Form; AUDIT, Alcohol Use Disorders Identification Test.

group, the reverse effect was found with a strong positive relationship between perceived meaning and alcohol use,  $\beta = 2.28$ ,  $t(61) = 2.10$ ,  $p = 0.04$ . As seen in Fig. 2, at low levels of depression, increased meaning lessens alcohol use. At high levels of depression, higher levels of perceived meaning are actually associated with increased use of alcohol.

## Discussion

The pattern of correlations found in this study, if replicated, may have interesting treatment implications. For students encountering negative consequences from drinking, addressing issues pertaining to perceived meaninglessness or lack of purposeful goals may be beneficial beyond focusing solely on depressive symptoms generally. If there is an association between alcohol use and depression that was not adequately detected by the current method, however, it may have been due to low endorsement of depressive symptoms. For the CES-D, the mean score was 13.17 (SD = 9.41) with scores ranging from 0 to 47 (highest possible score = 60). This mean is slightly lower than that reported in other studies utilizing college samples (e.g. male mean = 16, SD = 12.0; female mean = 18, SD = 12.3; Santor et al., 1995). Differences in the patterns of correlation by sex might reflect differences in the way these variables are related or may be a product of the smaller sample size for men. One puzzling difference involves the strong correlation between depression and meaninglessness for women and the lack of significant correlation for men. This lack of association is inconsistent with previous findings (e.g. Feldman & Snyder, 2005; Mascaro & Rosen, 2005, 2008; Steger et al., 2009).

The subsequent regression analyses revealed an unexpected pattern of results. Although the model including perceived meaning and depression was significant in the prediction of alcohol use, it was meaning that accounted for variance in alcohol use for men and women

combined. These results point to the importance of assessing perceived meaning among college students presenting for substance use treatment and further suggests potential utility in incorporating meaning/values-based substance abuse interventions for this population. When predictive ability of the model was examined separately by sex, the model was no longer significant for women, but the interaction term was a significant predictor for men. *Post hoc* analyses revealed that for men experiencing low to average levels of depression, increased meaning reduced alcohol use. At high levels of depression, however, higher levels of meaning were actually associated with increased use of alcohol. On the surface, these results are seemingly inconsistent with previous findings (e.g. Padelford, 1974; Orcutt, 1984). One hypothesis may be that depressed men perceive heavy drinking as an effective means of actualizing values (e.g. belonging and respect from peers). There is research suggesting that university students who endorse more favourable attitudes towards drinking are more likely to report interpersonal values, especially those related to excitement (Kropp et al., 2004).

This study has several limitations. For instance, the limited range on the measures employed may have resulted in reduced variability of responses. Additionally, because this study employed a correlational design, causation cannot be inferred. Finally, since the sample included primarily Caucasian women approximately 19 years old, generalizing these findings should be done with due caution. The imbalance of men and women was not ideal and may have impacted results. Although this sample generally approximates the population from which it was drawn, future studies should target a more nationally representative sample of college students. Additionally, it would be important to obtain data from students seeking services at university counselling centres who may present with higher depression, more frequent alcohol-related problems and less perceived meaning in life.

Despite some limitations, this study is promising in that it expands upon previous research pertaining to college student alcohol use and reveals potentially clinically relevant differences in patterns of association between men and women. Given the prevalence of problematic drinking by college students, it is important to determine useful intervention strategies. Of the interventions typically employed in college settings, those considered most efficacious are cognitive behavioural therapy and motivational interviewing (National Institute on Alcohol Abuse and Alcoholism, 2002). These approaches incorporate values clarification and the development of purposeful goals to some extent. Therefore, demonstrating perceived meaning as a protective factor against hazardous drinking is an important step in determining the utility of meaning-based treatment components.

#### *Declaration of interest*

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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