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ORIGINAL ARTICLE

# "It's Complicated": Exploring the Mindfulness-Alcohol Use Connection in Undergraduate Students

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**Abstract** We sought to further clarify the underlying connections between facets of mindfulness, alcohol use, and mental health. A total of 203 at-risk college students at a southeastern university participated in this quantitative, cross-sectional study. We specifically explored (1) the extent to which dispositional mindfulness correlated with neuroticism (i.e., anxiety, depression, and happiness) and (2) the connection between facets of mindfulness and problematic alcohol use, including the predictive ability of mindfulness traits to recent drinking-related consequences. Results revealed low mindfulness was associated with higher negative emotion and lower happiness. In contrast, nuanced relationships were found among mindfulness facets and risky alcohol use. Specifically, Acting with Awareness was a significant negative predictor of recent drinking-related consequences, while Nonjudging was a significant positive predictor. Mindfulness appears to be a protective factor for neurotic subtraits, though further research is needed to clarify the impact of mindfulness facets on alcohol and other substance use behaviors.

**Keywords** Mindfulness · Alcohol use · Anxiety · Depression · College students

High levels of anxiety and the engagement in substance use, particularly alcohol use, are normative experiences for college students. This population tends to engage in more frequent and unhealthy use of alcohol, such as binge drinking, in comparison to their same-aged counterparts (Collison et al. 2016). Intuitively, it stands to reason the more mindful one lives, the less likely one will engage in unhealthy or risky behaviors, like abusing substances when feeling distressed or overwhelmed. A significant body of evidence indicates mindfulness is connected to increased engagement in healthy behavior (Brown and Ryan 2003; Gao and Shi 2015) and reduced experiences of emotional distress and chronic pain (Baer 2003; Brown et al.

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2007; Chiesa and Serretti 2014; Fernandez et al. 2010); thus, mindfulness is often considered protective. The effective implementation of mindfulness interventions on reducing alcohol use behaviors in clinical and prison settings is promising (Alterman et al. 2004; Bowen et al. 2006; Bowen et al. 2007; Chiesa and Serretti 2014), and the appropriate application of these interventions in the general population is compelling. In order for prevention and intervention efforts to be effective on a large scale, underlying mechanisms must be clearly understood. Thus, we sought to untangle relationships among facets of mindfulness, problematic alcohol use behaviors, and mental health correlates in an at-risk college population.

Mindfulness is rooted in Buddhism, with a particular focus on spiritual and moral well-being. In Western psychology and clinical practice, mindfulness has undergone various adaptations and often focuses on development of a particular mindset or implementation of specific skills, largely without emphasis on spiritual development per se (e.g., Bergomi et al. 2013; Bishop et al. 2004; Brown et al. 2007; Chiesa 2013; Hart et al. 2013; Williams et al. 2014); yet, as research and practice continue to evolve, a second generation of spiritual-centered mindfulness has emerged (e.g., Shonin and Van Gordon 2016; Singh et al. 2014). Consequently, intervention models incorporating mindfulness either approach (e.g., meditation awareness training) or diverge (e.g., mindfulness-based cognitive therapy) from traditional spiritual foundations (Shonin and Van Gordon 2016).

Despite varying approaches to mindfulness, they tend to share three common features: (1) making oneself aware of one's present thoughts while participating in the experience; (2) willingly paying attention to these thoughts without judging their value or connecting them to memories, emotions, and pre-existing ideas; and (3) accomplishing these goals through mental self-regulation or meditation (Baer 2003; Bishop et al. 2004; Brown et al. 2007; Chiesa 2013; Hart et al. 2013). Furthermore, individuals may vary in their level of mindfulness in a temporary behavior per situation (i.e., state) versus engagement in stable behavior across situations (i.e., trait or disposition; Bishop et al. 2004; Brown et al. 2007; Chiesa 2013; Hart et al. 2013; Thompson and Waltz 2007).

Mindfulness-based interventions (MBIs) may work well in targeting risky behaviors, such as substance misuse, because the thought processes behind substance use and mindfulness practices are incompatible (Garland et al. 2010). For example, the misuse, abuse, and craving of alcohol is often triggered by stress and exacerbated by a lack of effective coping strategies, which can prompt biases toward alcohol cues and using alcohol as a method of temporary escape (Garland et al. 2010; Garland et al. 2012). The concept of mindfulness, by contrast, emphasizes being aware of and paying attention to one's thoughts without immediate and perhaps impulsive reactions (Bishop et al. 2004).

Numerous studies have found people who abuse substances show deficits in trait mindfulness (e.g., Dakwar et al. 2011; Fernandez et al. 2010; Levin et al. 2014). Levin et al. (2014) found that individuals who currently abused substances or had a history of substance abuse lacked certain facets of trait mindfulness using the Five Factor Mindfulness Questionnaire (FFMQ). Specifically, Fernandez et al. (2010) also used the FFMQ and stated that the *Describing* [of thoughts and feelings] and *Acting with Awareness* subscales were negatively associated with excessive use of alcohol among college students, and suggested that practicing mindfulness would reduce substance abuse behaviors. Furthermore, Dakwar et al. (2011) found similar results using the Mindful Attention Awareness Scale (MAAS) with adult substance users.

Elements of mindfulness and emotion have been linked to problematic substance use, as well as particular personality traits (Giluk 2009; Latzman and Masuda 2013; Thompson and

Waltz 2007). Based on current literature, of the Big Five personality traits, neuroticism has emerged as the most significant correlate to mindfulness, and subsequently has received the most attention (Giluk 2009; Johns et al. 2013). Often considered synonymous with negative emotionality or negative affectivity, neuroticism is a stable, multi-faceted personality trait that encompasses worry, anxiety, and sadness (Barnhofer et al. 2011; Lahey 2009; Yoon et al. 2013; Zupančič and Kavčič 2013). Previous studies have found it to be a significant predictor of depression, anxiety disorders, substance use disorders, and subjective well-being (Lahey 2009; Weiss et al. 2008; Yoon et al. 2013). People who exhibit high levels of neuroticism tend to use maladaptive emotional regulation strategies—such as rumination (i.e., obsessively thinking about and attaching meaning to negative emotions), thought suppression (i.e., attempting to not think about stressful situations, which can intensify anxiety), or expressive suppression (i.e., attempting to constrain a physical show of emotion)—as well as maladaptive coping strategies (e.g., use of substances) to deal with distress (Lahey 2009; Yoon et al. 2013). By contrast, mindfulness can be considered incompatible with neurotic traits (i.e., rumination, worry) because of the emphasis on focusing on the present moment and nonjudgment of experiences (Chiesa and Serretti 2014; Feltman et al. 2009; Giluk 2009). Not only is mindfulness incompatible with the personality trait neuroticism, but also the practice of mindfulness provides a contrary experience to that of anxiety and depression.

Previous studies have supported the efficacy of MBIs in reducing both anxiety and depression directly (Hofmann et al. 2010; Keng et al. 2011; Khoury et al. 2015). With this compelling research, mindfulness could effectively diminish mental health correlates of neuroticism, such as anxiety and depression, as well as reduce the use of maladaptive emotional regulation strategies (e.g., substance use and misuse as a means of temporary escape). For example, Barnhofer et al. (2011) found that participants with high dispositional mindfulness significantly weakened the neuroticism-depression relationship, while Feltman et al. (2009) found that dispositional mindfulness was a significant negative predictor of depressive symptoms.

Mindfulness and neuroticism are also related to subjective happiness, a subset of subjective well-being. Previous research has found neuroticism and mindfulness to be predictive of subjective happiness (Akin and Akin 2015; Lauriola and Iani 2015). For example, Lauriola and Iani (2015) identified neuroticism as the best predictor of unhappiness. Moreover, Akin and Akin (2015) found a positive relationship between subjective happiness and mindfulness, such that subjective happiness increased as mindfulness increased. Therefore, mindfulness can be considered a protective factor against neuroticism and an enhancing factor for subjective happiness. College students are at risk for experiencing anxiety and depression, which then may negatively influence a student's ability to cope effectively and engage in problematic alcohol use. Since previous research has supported the use of mindfulness on diminishing anxiety, depression, and neurotic traits in clinical populations, it stands to reason these mental health issues can be targeted in a non-clinical, yet at-risk, student population.

The purpose of the current study was to clarify connections among facets of mindfulness, alcohol use behaviors, and mental health correlates in an at-risk college sample using a cross-sectional design. Our aims for this project were twofold: Firstly, we were interested in determining the extent to which self-reported levels of dispositional mindfulness relate to mental health correlates of neuroticism, such as the experience of anxiety, depression, and happiness. Secondly, we were interested in learning the extent to which facets of mindfulness relate to engagement in problematic alcohol use behaviors, and the extent to which mindfulness traits can predict recent negative alcohol-related consequences within a 3-month period. We hypothesized individuals with low levels of dispositional mindfulness would report higher

levels of negative emotion (depression and anxiety) and lower levels of subjective happiness. We also expected to reveal a negative relationship between dispositional mindfulness and recent alcohol use problems. Moreover, we expected facets of mindfulness to be predictive of the experience of recent negative alcohol-related consequences. That is, low levels of dispositional mindfulness would be predictive of a experiencing a number of negative substance-related consequences.

## Method

### Participants

A total of 203 undergraduate students (female: $n = 68.50\%$) from a southeastern university participated in this study for partial completion of a course requirement or to obtain extra credit. The age of the sample ranged between 18 to 26 years with a mean of 19.10 years ($SD = 1.29$). All individuals interested in participating in this study were allowed, with the exception of those under the age of 18. Participants were recruited through the Psychology Department's SONA system, an online recruitment system for the purposes of research. The sample self-identified predominantly as White/Caucasian ($n = 123$, 60.60%), followed by Black/African American ($n = 61$, 30.00%), Hispanic/Latino ($n = 4$, 2.00%), Asian/Asian American ($n = 1$, 0.50%), Pacific Islander/Native Hawaiian ($n = 1$, 0.50%), biracial ($n = 4$, 2.00%), and multi-racial ($n = 9$, 4.40%). A majority of the sample self-identified their sexual orientation as heterosexual ($n = 180$, 88.70%), and a small subset identified as lesbian ($n = 1$, 0.50%), bisexual ($n = 14$, 6.90%), asexual ($n = 6$, 3.00%), or other ($n = 2$, 1.00%). More than half of the sample reported engaging in current alcohol use ($n = 113$, 55.70%). For the remainder of the sample, 27.10% ($n = 55$) of participants reported consuming alcohol in the past, but not within the last 3 months, and 17.20% ($n = 35$) reported no prior alcohol use in their lifetime.

Sample size was considered prior to data collection to ensure sufficient power was achieved for all analyses conducted in the current study. Based on Green's (1991) recommendation, a sample size of approximately 110 would ensure detection of large effects and doubling the sample would ensure detection of small-to-moderate effects for multiple regression analyses. Thus, a sample size of 203 increases both adequacy of power and confidence in interpretation of significant results.

### Design

A cross-sectional design investigated trait (dispositional) mindfulness in relation to recent experiences (or lack thereof) of alcohol use problems, negative emotion (anxiety, depression), and positive emotion (subjective happiness). All participants completed a battery of self-report questionnaires, which were presented in random order to prevent potential ordering effects. Data for this project was collected in accordance to IRB regulations. No participants dropped out or withdrew their data as a result of undue stress caused by participation for the duration of data collection.

### Measures

**Mindfulness** In order comprehensively assess aspects of mindfulness, two separate self-report measures were used to determine both levels of dispositional mindfulness and the

presence of specific mindfulness skills. The 15-item Mindful Attention Awareness Scale, trait version (MAAS-T; Brown and Ryan 2003) assessed general levels of dispositional mindfulness in participants; that is, the extent to which individuals employ a present-focused orientation of their current experiences, free from cognitive appraisals or judgments. Participants were asked to respond on a 6-point Likert-type scale, with 1 representing "Almost Always" and 6 representing "Almost Never." The MAAS-T total score is calculated by taking the averaged sum of responses, and higher scores indicate a higher level of dispositional mindfulness. Normative information for college students indicates a score of 3.83 ($SD = .70$) is average. Internal consistency scores, both in past research ($\alpha = .80–.90$; Brown and Ryan 2003) and in the current study ($\alpha = .90$), indicate the measure is adequately reliable.

Facets of mindfulness, specifically skills related to being mindful, were assessed with the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al. 2006; Baer et al. 2008), which consists of 39 items and five subscales, including Nonreactivity (e.g., "In difficult situations, I can pause without immediately reacting"), Observing (e.g., "I notice how foods and drinks affect my thoughts, bodily sensations, and emotions"), Acting with Awareness (e.g., "I find myself doing things without paying attention"), Describing (e.g., "It's hard for me to find the words to describe what I'm thinking"), and Nonjudging (e.g., "I tell myself that I shouldn't be thinking the way I'm thinking"). Participants were asked to respond on a 5-point Likert-type scale, with 1 representing "never or very rarely true" and 5 representing "very often or always true" (Baer et al. 2006). Higher scores on a subscale indicate a stronger presence of the corresponding mindfulness skill (Baer et al. 2006). The five subscales have demonstrated acceptable internal reliability in previous studies: Nonreactivity ($\alpha = .75$), Observing ($\alpha = .83$), Acting with Awareness ($\alpha = .87$), Describing ($\alpha = .91$), and Nonjudging ($\alpha = .87$; Baer et al. 2006). The subscales of the FFMQ exhibited acceptable internal reliability in this study (Nonreactivity: $\alpha = .77$; Observing: $\alpha = .79$; Acting with Awareness: $\alpha = .91$; Describing: $\alpha = .85$; Nonjudging: $\alpha = .90$).

**Alcohol-Related Problems** Recent alcohol use problems were assessed with the 50-item Drinker Inventory of Consequences-Recent (DrInC-2R; Miller et al. 1995). The DrInC-2R is a modified version of The Drinker Inventory of Consequences-Lifetime (DrInC-2L; Miller et al. 1995), and assesses recent experiences of negative, drinking-related consequences experienced in the last 3 months. The DrInC-2R produces five subscale scores (Physical Consequences, Intrapersonal Consequences, Social Responsibility Consequences, Interpersonal Consequences, and Impulse Control Consequences), and a combined Total Problems score. Sample items include: "My drinking has caused me to use other drugs more," and "While drinking or using drugs, I have said harsh or cruel things to someone" (Miller et al. 1995). Experiences were rated using a 4-point Likert-type scale, with 0 representing "Never" and 3 representing "Daily or almost daily" (Miller et al. 1995). Internal reliability of the DrInC-2R has ranged from good to excellent ($\alpha = .85–.98$) in previous studies (Tartter and Ray 2012), and it produced adequate reliability in the current study ($\alpha = .82$).

**Emotion** Positive and negative emotions were assessed with two self-report questionnaires. The Subjective Happiness Scale (SHS; Lyumbomirsky and Lepper 1999), consisting of four items, assessed participants' experience of positive emotion with a 7-point Likert-type scale, with 1 representing "not a very happy person," "less happy," or "not at all," and 7 representing "a very happy person," "more happy," or "a great deal." Participants responded to items depending upon how they would complete or answer the presented statements and questions (e.g., "Some people

are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?"). Internal reliability for the SHS has ranged from acceptable to excellent ($\alpha = .79$–$.94$; Lyumbomirsky and Lepper 1999), and in the current study internal reliability was acceptable ($\alpha = .77$).

Negative emotion, as it pertains to the depression and anxiety (subtraits of neuroticism), was measured using a modified, 20-item version of the Depression, Anxiety, and Stress Scales (DASS-21-m; Antony et al. 1998; Lovibond and Lovibond 1995); in the current study, one depression item related to feelings of meaninglessness in life was removed due to the potential risk of heightened distress (i.e., greater than one would experience in an average day). Participants were asked to respond on a 4-point Likert-type scale, with 0 representing "Did not apply to me at all" and 3 representing "Applied to me very much, or most of the time." Higher scores indicate a higher incidence of symptoms. The three subscales of the DASS-21-m have exhibited good or excellent internal reliability in previous research: DASS-D ($\alpha = .94$), DASS-S ($\alpha = .91$), and DASS-A ($\alpha = .87$; Antony et al. 1998). The Anxiety and Depression subscales were used in the current study and each demonstrated acceptable internal reliability: DASS-A ($\alpha = .79$) and DASS-D ($\alpha = .83$).

**Sample Characteristics** A demographics questionnaire was administered to each participant to assess characteristics related to age, sex, race/ethnicity, sexual orientation, enrollment status, and history of alcohol use.

### Procedure

This study was administered in a psychology laboratory on a university campus. Up to three undergraduate students participated in this study at one time. Upon arrival, each participant was instructed to sit at one of three computer stations. After obtaining informed consent, participants received standardized instructions to work individually for the duration of a single 60-to-75-min session. Each participant completed a battery of questionnaires, including the MAAS-T, FFMQ, DrInC-2R, SHS, DASS-20 in randomized order, and the demographics questionnaire at the end of the study. All questionnaires were administered using MediaLab v2012 software on PCs with Windows 7 operating systems. All measures were presented in random order to prevent potential ordering effects. At the conclusion of the study, participants were debriefed and awarded credit for their participation.

## Results

### Preliminary Correlational Analyses

Pearson correlations were calculated to assess the direction of relationships between all variables of interest, including level of mindfulness (MAAS-T), anxiety (DASS-A), depression (DASS-D), subjective happiness (SHS), problematic alcohol use behavior (DrInC-2L), and facets of mindfulness (FFMQ subscales). Means and standard deviations for each variable are presented in Table 1. Pearson correlations ($r$) are presented in Table 2.

Dispositional mindfulness (MAAS-T) was moderately-to-strongly and positively related to various facets of mindfulness, including mindful observation (FFMQ-Observe) and Acting

**Table 1** Descriptive statistics (means and standard deviations) of the sample

| Variable | *M* | *SD* |
|---|---|---|
| DrInC-2R (recent drinking problems) | 3.22 | 3.38 |
| DASS-A (anxiety) | .86 | .33 |
| DASS-D (depression) | .75 | .32 |
| SHS (subjective happiness) | 19.28 | 4.24 |
| MAAS-T (dispositional mindfulness) | 3.70 | .88 |
| FFMQ-observe (mindful observation) | 25.41 | 5.57 |
| FFMQ-describe (mindful descriptions) | 24.90 | 5.58 |
| FFMQ-actaware (mindful action) | 24.34 | 6.65 |
| FFMQ-nonjudge (mindful nonjudgment) | 23.89 | 6.73 |
| FFMQ-nonreact (mindful nonreactivity) | 20.03 | 4.33 |

with Awareness (FFMQ-actaware), as well as subjective happiness (SHS). Conversely, dispositional mindfulness (MAAS-T) was negatively related to the experiences of alcohol-related problems (DrInC-2R), anxiety (DASS-A), and depression (DASS-D) at a moderate level. These relationships suggest as dispositional mindfulness increases, mindful behaviors and skills increase, as well as the experience of happiness; as dispositional mindfulness decreases, psychological distress in the forms of anxiety and depression increase, as well as engagement in problematic alcohol use and the experience of negative alcohol-related consequences as a result. The mindfulness facet of Acting with Awareness (FFMQ-actaware) was also moderately and negatively correlated with negative alcohol-related consequences (DrInC-2R). As expected, subjective happiness (SHS) was strongly and significantly negatively correlated with anxiety (DASS-A) and depression (DASS-D), and anxiety positively correlated with alcohol use problems, although this relationship was small.

## The Connection Between Dispositional Mindfulness and Emotion

In this sample ($N = 203$), general mindfulness scores ranged from 1.27 to 5.67 on the MAAS-T, with a mean score of 3.70 ($SD = .88$). The mean score for anxiety (DASS-A) in this sample was $M = .86$ ($SD = .33$). The mean score for depression (DASS-D) in this sample was $M = .75$

**Table 2** Correlations (Pearson's *r*) between measures of mindfulness, emotion, and alcohol-related consequences

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. MAAS-T | – | | | | | | | | | |
| 2. FFMQ-Observe | .002 | – | | | | | | | | |
| 3. FFMQ-Describe | .24** | .24** | – | | | | | | | |
| 4. FFMQ-ActAware | .76** | −.07 | .27* | – | | | | | | |
| 5. FFMQ-Nonjudge | .43** | −.30* | .09 | .50** | – | | | | | |
| 6. FFMQ-Nonreact | .02 | .31** | .17* | −.04 | −.12 | – | | | | |
| 7. DASS-A | −.41** | .14 | −.29** | −.40** | −.40** | −.16* | – | | | |
| 8. DASS-D | −.29** | .04 | −.37** | −.32** | −.36** | −.16* | .52** | – | | |
| 9. SHS | .33** | .13 | .35** | .32** | .30** | .27** | −.49** | −.62** | – | |
| 10. DrInC-2R | −.26** | .10 | −.08 | −.25** | −.03 | .03 | .18* | .002 | −.002 | – |

All correlations are two-tailed. MAAS-T (Mindful Attention Awareness Scale-Trait Version); FFMQ (Five Facets of Mindfulness Questionnaire); DASS (Depression, Anxiety, and Stress Scales); SHS (Subjective Happiness Scale); DrInC-2R (Drinker Inventory of Consequences-Recent

*$p < .05$; **$p < .01$

($SD = .32$). The mean score for subjective happiness (SHS) in this sample was $M = 19.28$ ($SD = 4.24$).

Participants were divided into high and low mindfulness groups based on a median split of MAAS-T scores. The median score on the MAAS-T was 3.67; therefore, those scoring 3.6 and below were designated to the "low mindfulness group" ($n = 94$), while those who scored 3.73 and above were designated to the "high mindfulness group" ($n = 99$). To ensure adequate separation between groups, those who scored 3.67 ($n = 10$) were removed from the remainder of this portion of analysis.

A multivariate analysis of variance (MANOVA) was conducted to examine potential differences between low and high levels of mindfulness on the experiences of depression, anxiety, and subjective happiness. Initially, data were examined using SPSS Statistics to ensure all statistical assumptions were met. Univariate normality, assessed with the Shapiro-Wilk test and boxplots, could be assumed; however, Box's $M$ was significant at $\alpha = .001$, indicating a violation of homogeneity of variance-covariance matrices. Although this violation is not considered problematic because the MANOVA is robust against violations of univariate normality when group sizes are similar and exceed 30, the Levene's test of equality of error variance was also significant at the .05 level for two of the dependent variables. To address these violations, log transformations were computed for the Depression and Anxiety and Subjective Happiness scales. Following this adjustment, evaluation of test assumptions could be assumed: Box's $M$ was nonsignificant, as well as Levene's test statistic.

As all underlying assumptions were supported by the data, a MANOVA was conducted. Findings showed a significant effect in level of mindfulness (low vs. high) on the combined dependent variables (positive and negative emotion), $F(3, 161) = 5.60$, $p = .001$, partial $\eta^2 = .11$. Analysis of dependent variables individually showed significant differences between groups on only one of the three dependent variables at the corrected Bonferroni adjusted alpha level of .017: anxiety, $F(1, 163) = 16.71$, $p < .001$, partial $\eta^2 = .10$, was statistically significant. Participants in the low mindfulness group reported significantly higher anxiety levels ($M = .91$), than those in the high mindfulness group ($M = .77$). subjective happiness, $F(1, 163) = 5.48$, $p = .02$, partial $\eta^2 = .03$, and depression, $F(1, 163) = 4.733$, $p = .03$, partial $\eta^2 = .03$, were not statistically significant at the corrected $p$ value level. Participants in the high mindfulness group reported similar levels of subjective happiness ($M = 19.92$) and depression ($M = .70$) in comparison to the low mindfulness group ($M = 18.20$ and $M = .81$, respectively). Group means and standard deviations for each dependent variable are presented in Table 3.

## Predicting Alcohol-Related Problems

To estimate the proportion of variance in the recent experience of drinking-related problems (DrInC-2R) that can be accounted for by facets of mindfulness (FFMQ), a standard multiple regression analysis (MRA) was performed.

Prior to interpreting the results of the MRA, assumptions of normality and collinearity were evaluated and met. Mahalanobis distance did not exceed the critical $\chi^2$ value for $df = 5$ (at $\alpha = .001$) of 20.52 for any cases in the data file, indicating multivariate outliers were not of concern. Relatively high tolerances for all predictors in the regression model indicated that multicollinearity would not interfere with our ability to interpret the outcome of the MRA.

In combination, facets of mindfulness accounted for a significant 9.3% of the variability in recent experience of drinking-related problems, $R^2 = .093$, adjusted $R^2 = .070$, $F$ (5, 197) =

**Table 3** Descriptive statistics for the low mindfulness group ($n = 87$) and high mindfulness ($n = 78$) group on each dependent variable included in the MANOVA

| Dependent variable | Group | *M* | *SD* |
|---|---|---|---|
| Anxiety (DASS-A) | Low mindfulness | .91 | .33 |
| | High mindfulness | .77 | .28 |
| Depression (DASS-D) | Low mindfulness | .81 | .34 |
| | High mindfulness | .70 | .29 |
| Subjective happiness | Low mindfulness | 18.20 | 4.69 |
| | High mindfulness | 19.92 | 3.50 |

4.03, $p = .002$. The effect size of this model is small ($d = 0.1$). The Acting with Awareness and Nonjudging subscales of the FFMQ were unique predictors of drinking-related problems in the last 3 months. Specifically, FFMQ-Acting with Awareness was a negative predictor of problems; as awareness of one's current actions decreases, drinking-related problems increase. FFMQ-Nonjudging was a positive predictor of drinking-related problems in the last 3 months; that is, as judgment of one's experiences decreases, drinking-related problems increase. Unstandardized (*B*) and standardized (β) regression coefficients for each predictor in the regression model are reported in Table 4.

## Discussion

Mindfulness is a burgeoning research area with a wide variety of applications, but the diversity with which it can be defined and measured has often led to inconsistent or contradictory findings. Therefore, instead of choosing a single measure to represent the construct, the current study sought to explore multiple types and facets of mindfulness as they relate to emotions and problematic alcohol use in a non-clinical, yet at-risk sample. Specifically, mindfulness was used to understand the complex nature between it and subjective happiness, depression, anxiety, and recent alcohol use in undergraduate students.

The current study investigated the relationship between overall mindfulness and positive affect (as measured by subjective happiness, a subset of overall well-being) and negative affect (as measured by two subtraits of neuroticism—depression and anxiety) by using the MAAS-T. As predicted, individuals high in mindfulness reported significantly higher feelings of subjective happiness, and significantly lower feelings of depression and anxiety, than individuals low in mindfulness. Also, as predicted, individuals low in mindfulness reported significantly higher feelings of depression and anxiety, and significantly lower feelings of subjective happiness, than their high in mindfulness counterparts. These findings are consistent with previous

**Table 4** Unstandardized (B) and standardized (β) regression coefficients for each predictor in a regression model predicting recent experience of drinking-related problems

| Variable | *B* [95% CI] | β |
|---|---|---|
| Nonreactivity | 0.00 | 0.00 |
| Observing | 0.08 | 0.14 |
| Acting with Awareness | − 0.16 | − 0.32** |
| Describing | − 0.02 | − 0.04 |
| Nonjudging | 0.09 | 0.18* |

$N = 203$. CI = confidence interval

*$p < .05$; **$p < .01$

research, which has found that mindfulness is inversely related to negative affect, neuroticism, depression, and anxiety, but positively related to subjective well-being and happiness (Barnhofer et al. 2011; Feltman et al. 2009; Lee and Bowen 2014; Pearson et al. 2015; Wenzel et al. 2015). These findings support the conceptualization of dispositional mindfulness as a protective factor in buffering against psychological distress, as well as a contributing factor to the enhancement of satisfaction and overall wellbeing.

Our second aim, however, elucidated a more complicated relationship between mindfulness and risky alcohol use—one that suggests mindfulness may not always be protective. As hypothesized, FFMQ facets of mindfulness significantly predicted recent alcohol-related problems. Specifically, the current study found that FFMQ-Acting with Awareness was a significant negative predictor of recent experiences with drinking-related problems—a finding consistent with that of past research (Fernandez et al. 2010; Karyadi et al. 2014; Levin et al. 2014). However, we also found that FFMQ-Nonjudging was a significant positive predictor of recent drinking-related problems, whereas in previous studies it has been a consistent, negative predictor of substance abuse (e.g., Fernandez et al. 2010; Levin et al. 2014). For example, in their meta-analysis on trait mindfulness and substance use, Karyadi et al. (2014) found Acting with Awareness, Nonjudging, and Nonreactivity were the most significant, negative, and co-occurring predictors of substance use. In relation to our current findings, individuals who are high in some facets of mindfulness may lack in others (Levin et al. 2014); therefore, it is possible some of the people who are high in Nonjudging have deficits in other facets, such as Acting with Awareness; to that end, some facets of mindfulness may only be effective when paired with others. In other words, it stands to reason if individuals are less judgmental of their experiences, they also may be less likely to feel shame or guilt when faced with a negative consequence, which in turn results in continued engagement in risky alcohol use without significant behavioral change.

As a whole, these findings challenge the notion of mindfulness as holistically a positive practice that results in predominantly positive outcomes. The current results reveal an alternative side to mindfulness and raise the question: In what ways can facets of mindfulness contribute to engagement in risky behaviors? This question is one to be pursued for years to come, not only with regard to substance use but also other risky behaviors, such as gambling or stealing, whereby nonjudgment (or other facets of mindfulness) may contribute to increased engagement in such behavior.

## Limitations and Future Directions

This study has a number of limitations. Primary limitations relate to study design and participant recruitment. The cross-sectional nature of this study limits our ability to draw more complex interpretations regarding the nature of the observed relationships. For instance, we cannot state with any amount of certainty the nature of the relationships between anxiety, depression, and substance use—if one causes the other. Moreover, the sample in the current study focuses on one university in the southeast. It is completely possible these results are due to specific cultural aspects of the region. Additionally, measures included in this study were solely self-report based and vulnerable to response biases. Moreover, we limited our focus to common mental health correlates of a single personality trait (neuroticism), reducing our ability to understand how mindfulness interacts with personality traits and alcohol use broadly. In the future, it will be helpful to expand this study to multi-university sites, while also adding more behavioral or clinical indicators to assess substance use behaviors, personality, and mental health issues. While measuring the relationship of personality traits directly was beyond the scope of this study, it would be beneficial to incorporate the construct into future research. In addition to assessing

neuroticism directly, conscientiousness, for example, has exhibited many similarities to mindfulness, and has demonstrated significant predictive value in determining outcomes in the workplace, a setting where mindfulness practices are increasingly introduced (Giluk 2009). That being said, future research should examine whether disparate types and facets of mindfulness are differentially related to conscientiousness, as they are to correlates of neuroticism and substance use. Furthermore, the use of MBIs in the future can establish more complex interpretations of the current study's findings. For example, the use of MBIs could be used to examine the influence of mindfulness on subjective happiness and psychological distress, while also examining specific MBI techniques most effective in targeting these psychological constructs.

## Conclusion

This study has raised some new questions, and justified the pursuit of some old ones, in regard to mindfulness and substance use. It appears mindfulness as a whole is a protective factor, in that it buffers individuals from experiencing excessive anxiety, depression, and unhappiness; however, when it comes to engaging in problematic alcohol use, depending on the type of mindfulness in question, it is not always fail-safe. Acting with Awareness, whether it is one of a group of significant facets or the only significant facet, has consistently shown to be a positive buffer against substance misuse, such that substance use behaviors are reduced as mindful actions increase. The mindful facet of nonjudgment, on the other hand, seems to demonstrate a more nuanced effect on substance use when in concert with several other facets.

When predicting recent alcohol-related problems, most facets of mindfulness serve as protective factors against negative alcohol-related experiences; however, in our current college sample, the mindful facet of nonjudgment proved to be a risk factor. Because of this inconsistency with existing research, these findings must be reproduced. Future research should consider the impact of different combinations of facets (e.g., Acting with Awareness, Nonjudging, and Nonreactivity) on substance use behaviors in addition to alcohol, and in broader non-clinical populations. Moreover, future research should continue to examine the nuances among different facets of mindfulness when used within the same samples and determine what they tell us about the intricacies of destructive behavior in at-risk, non-clinical populations. Because not all aspects of mindfulness appear equal (or protective), such knowledge will help enhance targeted prevention efforts to reduce the likelihood of developing long-term mental health and alcohol use problems.

#### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflicts of interest.

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