THE RELATIONSHIP BETWEEN MINDFULNESS, ANXIETY AND DEPRESSION
IN LONG-TERM TWELVE-STEP PROGRAM PARTICIPANTS

A thesis submitted in partial fulfillment of the requirements

For the degree of Master of Arts in Psychology,

Clinical Psychology

By

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ABSTRACT

The Relationship Between Mindfulness, Anxiety and Depression in Twelve-Step Program

By

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Master of Arts in Psychology

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Substance use disorders and anxiety and depression are regularly comorbid. Mindfulness has been demonstrated to negatively correlate with anxiety and depression, while mindfulness practices have been shown to improve anxiety and depression. With purposive snowball sampling, this study was advertised in 12-step related FaceBook groups. Adult participants (n = 135) who were at least one year sober and involved in a 12-step group filled out self-report surveys on mindfulness, anxiety, and depression. Results of the study indicate that mindfulness is negatively correlated with both anxiety and depression in this sample at $p < .001$. Because people with histories of substance use disorders are at risk for anxiety and depression, mindfulness and the practices which promote it may be used to attenuate anxiety and depression in this population.
CHAPTER 1
INTRODUCTION

The purpose of this thesis is to examine the relationship between mindfulness and anxiety and depression in people with substance use disorder that has been in remission for at least one year. To begin, there will be a review of the literature on substance use disorders and comorbid anxiety and/or depression. Next, there will be an investigation of two factors which may underlie substance use disorders, anxiety and depression: emotion regulation and experiential avoidance. Finally there will be a discussion of mindfulness, which may target both experiential avoidance and emotion regulation and subsequently mitigate anxiety and depression.

Substance Use Disorders as they Relate to Anxiety and Depression

Addiction literature is replete with studies which point out that people with histories of anxiety and/or depression are at greater risk for developing substance use disorders (Goodwin, Stein, 2013; Boschloo, Vogelzangs, Smit, van den Brink, Veltman, Beekman, & Penninx, 2011; Shapira & Courbasson, 2010; Mohammadi, Aghajani, & Zehtabvar, 2011; Suttajit, Kittirattanapaiboon, Junsirimongkol, Likhitsathian, & Srisurapanont, 2012). Additionally, studies show that having an active substance use disorder increases the likeliness of developing an anxiety and/or depressive disorder (Goodwin & Stein, 2013; Boschloo et al, 2011). In 2004, The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) concluded that “substance use disorders and mood and anxiety disorders that develop independently of intoxication and
withdrawal are among the most prevalent psychiatric disorders in the United States” (pg. 807). This means that the mood and/or anxiety disorders were not symptomatic of intoxication or withdrawal. During this survey, over 43,000 respondents had a structured diagnostic interview administered to them in order to better understand the relationship between substance use disorders, anxiety disorders and mood disorders. Of the people who had sought help for their alcohol use disorder in the past 12 months, 40.69% and 33.38% had a comorbid mood disorder or anxiety disorder, respectively. Of the people who had sought help for any substance use disorder, 60.31% and 42.63% had a comorbid mood disorder or anxiety disorder, respectively.

In the 2011 Netherlands Study of Depression and Anxiety (NESDA), half of participants with comorbid alcohol use disorder and a depressive disorder had developed their alcohol use disorder after the onset of the depression. In 71.4% of people with comorbid alcohol use disorder and an anxiety disorder, the anxiety disorder was primary. Comorbid alcohol use disorder was secondary 83.9% of the time for people with both depressive and anxiety disorders. A recent study by Goodwin and Stein (2013) found that in their sample (n = 5,788) it was more often than not (50% for social phobia, 40% for post-traumatic stress disorder, and 30% for generalized anxiety disorder) that anxiety disorders were secondary to substance use disorders. While it is clear that the relationship between substance use disorders, depressive disorders and anxiety disorders is sequentially complex and reciprocal, it is important to note that more often than not,
substance use disorders develop secondarily in relation to a depressive and/or anxiety disorder.

Whatever the sequence of morbidity, it is clear that there exists a highly significant and clinically relevant relationship between substance use disorders, depressive disorders and anxiety disorders. There have been many studies about the mental health of people with active substance use disorders and people in treatment for their substance use disorders, or shortly after treatment. There are few studies, though, which investigate mental health qualities of people with longer term abstinence. Some might conclude that long-term abstinence in this population will highly correlate with positive mental health. This, though, may be a hasty conclusion.

Given the variety of sequencing of comorbidity, abstinence from substances, albeit extremely helpful, does not indicate complete mental health. In particular, people with depressive and/or anxiety disorders primary to their substance use disorders are logically at particular risk for anxiety and/or depression despite abstinence, given that these disorders seem to not be mechanistically created by the conditions of a substance use disorder itself. Further, people whose substance use was primary to their anxiety and/or depression might be implementing behavior which although topographically different than substance use, serves the same function; a function which may have helped initially develop anxiety and depression. What may have to begin to be explored are transdiagnostic factors which may underlie all three disorders. Low emotion regulation and more specifically habitual use of experiential avoidance (a strategy implicated in low
emotion regulation) have been posited as, and more recently supported to be a “unifying function of diverse symptom presentations and maladaptive behaviors” (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Mennin, Heimberg, Turk, & Fresco, 2002; Gross & Munoz, 1995; Kingston, Clarke, & Remington, 2010).

**Emotion Regulation and Experiential Avoidance**

“Emotion regulation consists of the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions…” (Thompson, 1994, pg. 27). Using a factor analysis during the creation of the Difficulties in Emotion Regulation Scale, Gratz and Roemer (2004) discovered six factors that comprise emotional regulation: acceptance of emotional responses, ability to engage in goal-directed behavior during emotional periods, ability to control impulses, awareness of emotions, having multiple strategies for emotional regulation, and clarity of emotions. The first factor, “acceptance of emotional responses”, reflects a proclivity to have negative secondary appraisal of one’s initial emotions. The second factor, “difficulties engaging in goal-directed behavior” reflects trouble sustaining attention and attaining tasks when experience difficult emotions. The third factor, “impulse control difficulties” is endorsed when there is a problem being in control of one’s own behavior when experiencing negative emotions. The fourth factor, “lack of emotional awareness” has to do with the ability to be aware of and acknowledge emotions. The fifth factor, “limited access to emotion regulation strategies” is endorsed when someone has little confidence in their ability to or the possibility to regulate emotions. The six factor, “lack of emotional
clarity” reflects the degree to which individuals are clear about which specific emotions are experienced.

Regulating emotion allows one to experience varying topographies and intensities of emotion while still behaving in an adaptive and organized way. The inability to modulate the duration and intensity of emotions will be referred to as “low emotion regulation”. This inability to regulate one's emotions creates a greater likeliness of developing a habit of experiential avoidance to cope with persistent unpleasant emotions (Gratz & Roemer, 2004).

Experiential avoidance is “when a person attempts to escape, avoid, or modify experiences such as thoughts, memories, emotions or bodily sensations (Hayes & Wilson, 1996). It is clear how this would temporarily reduce distress and that through negative reinforcement, avoidance may become habitual. There is an immediate reduction in unpleasant inner experience when one simply avoids the experience in some way. While, experiential avoidance is a strategy to regulate emotion, it is maladaptive because as Hayes et al., (1996) theorizes, experiential avoidance “restricts needed change”. This is a dominant reason experiential avoidance may lead to psychopathology; instead of “putting deliberate change efforts in the service of necessary and useful life changes”, people avoid uncomfortable experiences through thought suppression, emotion suppression, (Shahar & Herr, 2011) or through more explicitly destructive behaviors such as substance use (Hayes et al., 1996), which all function as experiential avoidance.
In line with the theory of experiential avoidance restricting needed change as a producer and maintainer of psychopathology is a meta-analysis on coping styles and both physical and psychological health conducted by Penley, Tomaka, and Wiebe (2002). The results of this study found that coping styles which involved nonacceptance and/or more explicit avoidance were negatively correlated with positive psychological health. In addition, the one coping style in the study that was significantly and positively related to good psychological health was “problem-focused” coping, which involves “seeking information, planning, and taking action”. Clearly, someone who ends up taking deliberate action as a means of coping is not avoiding and subsequently restricting change.

More broadly, people high in experiential avoidance are more likely to have difficulty with all six facets of emotion regulation (Gratz & Roemer, 2004). In general, experiential avoidance is highly correlated with low emotion regulation and in particular the factors of having different emotion regulating strategies in one’s repertoire as well as emotional nonacceptance (Gratz & Roemer, 2004; Gratz & Bornovalova, 2007). In a study of 334 undergraduates, pessimistic belief in one’s own ability to regulate emotions moderated the relationship between depression, anxiety, stress and use of experiential avoidance. In people who had an optimistic sense of their own emotion regulation ability, anxiety, depression, stress and experiential avoidance were highly correlated (Fergus, Bardeen, & Orcutt, 2013). It is clear then that people who have difficulty tolerating and accepting difficult emotions who are also unable to skillfully modulate said
emotions are simply more likely to avoid them in some way. This avoidance circumvents needed change and as such, maintains and can even exacerbate anxiety and depression.

**Anxiety, Depression and Substance Use Disorders as they Relate to Emotion Regulation and Experiential Avoidance**

In a study by Vujanovic, Zvolensky, and Bernstein (2008), lack of emotion regulation ability moderated the effects of anxiety sensitivity on low levels of anxiety, while people with low amounts of anxiety sensitivity and low amounts of emotion regulation ability reported higher anxiety symptoms. This means low emotion regulation predicted higher anxiety regardless of anxiety sensitivity. More specifically, low emotion regulation predicted worry, catastrophic thoughts about bodily events, and anxious arousal. The results of this study impresses the important role of emotion regulation in its prediction of anxiety symptoms regardless of someone’s sensitivity to anxiety. This is further corroborated by a recent study of 171 psychiatric outpatients that found that the “ability to understand and recognize emotional information was negatively correlated to generalized anxiety disorder…” (Onur, Alkin, Sheridan, & Wise, 2013). Understanding and recognizing emotional information comprise the “emotional clarity” and “emotional awareness” factors of the Difficulties in Emotion Regulation scale. Similarly, in a study of 400 college students conducted by Bardeen, Fergus and Orcutt (2013) use of experiential avoidance was found to predict perceived stress and subsequent anxiety and depressive symptoms. This is because experiential avoidance “restricts needed change” and circumvents adaptive emotion regulation. Moreover, Salters, Pedneault, Roemer,
Tull, Rucker and Mennin (2006) found that individual deficits in regulation, as well as lack of emotion regulation in general, was associated with generalized anxiety disorder (as outlined in the DSM-IV-TR) in a group of 325 undergraduates. Individual regulation deficits found to be related to generalized anxiety disorder were “emotional clarity”, “acceptance of emotions”, “ability to engage in goal directed behaviors when distressed”, “impulse control”, and “access to effective regulation strategies” factors of the Difficulties in Emotion Regulation Scale.

Both low emotional regulation and high use of experiential avoidance are also predictive of symptoms of depression (Bardeen, et al., 2013; Vujanovic et al., 2008). In a study of 94 fully detoxified veterans with substance use disorder histories, those with more depressive symptoms were more likely to avoid negative affect (Forsyth, Parker, & Finlay, 2003). Further, in a sample of 171 psychiatric outpatients, the ability to recognize and understand emotional information, which are factors of emotion regulation, was negatively correlated to major depressive disorder. Shahar and Herr (2011) found that people with higher depressive symptoms used behaviors which functioned as experiential avoidance more often in a given day, regardless of how much negative affect the person experienced during the same day. This means that people with higher depressive symptoms have developed an inflexible habit of avoidance and use it even when there isn’t anything particularly unpleasant to avoid. This can create a sort of negative feedback loop, where avoidance behavior helps to maintain depression because it prevents people from engaging in anti-depressant, reinforcing activities and problem-
solving behavior, which leads to the need for further avoidance. (Jacobson, Martell, & Dimidjian, 2001). Indeed, Bridges et al. (2004) posit that problems emerge when strategies of emotion regulation are used inflexibly to cope with changing situational demands.

A study of marijuana users found that those with a low levels of emotional regulation tended to use marijuana in order to reduce negative emotions (Bonn-Miller, Vujanovic, & Zvolensky, 2008). In fact, it was the “nonacceptance” factor of the Difficulties in Emotion Regulation Scale that was the main predictor of coping-motivated marijuana use (which can also be called experiential avoidance through marijuana use). Another study (Kingston, Clarke, & Remington, 2010) found that experiential avoidance fully mediated the relationship between negative affect intensity and problem behaviors such as substance use, while yet another found that experiential avoidance predicted coping-motivated drinking in undergraduates (Stewart, Zvolensky, & Eifert, 2002).

These two studies support the notion that some people use substances in order to cope with unpleasant feelings by avoiding them. A recent study of coping styles and emotion regulation as predictors of substance use severity and age of onset found that people who were suppressors, that is, people who did not use any adaptive emotion regulation, were found to have started using substances earlier than the other groups and had the worst substance use severity. In contrast, people who utilized active coping (i.e., they would plan, talk to others, or try to reappraise a situation; not avoid, but accept and act) were the least severe of the substance users (Wong et al., 2013). This is consistent with the theory
and evidence which suggests that lack of acceptance or tolerance of unpleasant emotional experience is implicated as a motivating factor for substance use, which is then simply a convenient, instant, and effective means of experiential avoidance (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Linehan, 1993; Zvolensky, Schmidt, 2003; Forsyth et al., 2003).

To summarize, someone with poor emotion regulation skills will more often use experiential avoidance as a strategy to reduce distress, whether or not the distress is intense or more commonplace. One behavior that functions as experiential avoidance is substance use. While methods of experiential avoidance reduce distress temporarily, indeed this style of coping exacerbates distress over time. This can be an explanation for why substance use is both a "solution" for those with histories of anxiety and depression, as well as why people with substance use disorders are at greater risk for developing secondary anxiety and/or mood disorders. What might begin as ambient distress or normal anxiety can become, through poor emotion regulation skills and subsequent experiential avoidance, a cluster of clinically significant symptoms of anxiety and/or depression. This is in line with Hayes et al. (1996) suggesting that experiential avoidance, while ephemerally relieving distress, exacerbates it in the long run. It is also in line with current epidemiological understandings of the temporal sequencing and reciprocal nature of substance use disorders and anxiety and depression.

It can be surmised that just because someone has ceased a particular behavior that functions as experiential avoidance, there is no reason to believe they have ceased other
behaviors that serve the same function. Kingston, Clarke and Remington (2010) supported this idea that people who tend to behave in ways which function as experiential avoidance do so in a variety of ways. Additionally, ceasing a specific experientially avoidant behavior does not mean a person suddenly has the ability to regulate their emotions in an adaptive way. We can posit then, that people who maintain simple abstinence from substances are still likely to be low in emotion regulation in general and are likely to engage in behaviors which function as experiential avoidance. From here, it may be theorized that an individual who has stopped a single means of experiential avoidance, is still likely to be using other means of experiential avoidance and is still likely to be low in emotion regulation. From here, it can be seen that such an individual is still at risk for anxiety and depression.

It is clear that low emotion regulation and subsequent experiential avoidance and/or over engagement (i.e. rumination and worry) underlie a wide range of psychopathological symptoms, including those implicated in anxiety and depression. This may be why interventions such as Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), Mindfulness - Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002), and Dialectical Behavior Therapy (Linehan, 1993), all try to foster mindfulness explicitly and have non-avoidance and emotional acceptance at their core. If someone learns how to keep in contact with their experience without trying to alter, avoid or mitigate unpleasantness in some way, they are able to engage with
life in an adaptive way in which coping is oriented towards acceptance, planning, and taking positive action.

**Mindfulness**

Mindfulness has been defined as “the nonjudgmental observation of the ongoing stream of internal and external stimuli as they arise” (Baer, 2003). This means in a moment of mindfulness, one is simply alert to one’s experience without secondary processing about the present experience. Theoretically, this means that a highly mindful person is not ruminating, worrying, judging, comparing, or avoiding, but simply being open, observant, aware, and accepting. Mindfulness can be developed by intentional effort, most commonly through meditation practices. Meditation is broadly defined as the training of one’s attention in a systematic way to be oriented in the present. Mindfulness research has blossomed over the last decade as well as its inclusion as an intervention.

In general, mindfulness is incompatible with experiential avoidance because of the way which mindfulness brings us into direct contact with our experience. In mindfulness meditation, for instance, a person repetitively brings their attention back to their present moment experience with an attitude of openness, regardless of what emotions may be present. The person is exposed to varying emotional valences simply by being aware of their own experience and is trained to be in varying states of acceptance despite unpleasant (or pleasant) thoughts and emotions. Acceptance of emotion and awareness of emotion are both factors of the Difficulties in Emotion
Regulation Scale. In theory then, mindfulness meditation also improves factors of emotion regulation.

In a new model of the relationship between mindfulness, executive functioning and emotion regulation, Teper, Segal and Inzclicht (2013) acknowledge that mindfulness promotes both greater awareness and acceptance. Accordingly, the awareness that is refined through meditation practice enhances attention to and recognition of subtle cues (e.g. increased heart rate) that indicate nascent emotions. Before these nascent emotions become full-blown emotional reactions via secondary elaboration, mindful acceptance can be employed to fully prevent or mitigate this effect. This is because with mindfulness, secondary elaboration is not taken as seriously or may even not occur at all. Thus, the person is left with the original subtle cues to acknowledge, regulate and accept. From this position, one can behave in an adaptive way despite nascent emotions rather than being controlled by full blown emotional reactions. In addition, if awareness was not so great as to detect said subtle cues, and an emotional reaction occurs (as in the case of a novice of meditation, or someone with only moderate, rather than high mindfulness), acceptance may be employed as something akin to reappraisal of our relationship to the emotions/thoughts. This, in turn, stops the process which may turn into overengaging with and overelaborating on emotional stimuli; rumination and/or worry, behaviors associated with depression and anxiety. Early detection of emotion or subtle cues which indicate emotion is advantageous because once a nonconscious appraisal takes place, it is likely that further appraisals will have a similar trajectory (Bargh & Williams, 2007). So
then, awareness at subtle and inchoate stages of emotion allows for early acceptance and
subsequent adaptive behavior (cognitive or otherwise) before said emotion fully activates
and becomes maladaptive behavior (which may lead to exacerbation of problems and/or
emotions - as in the case of substance use i.e. experiential avoidance; Hayes et al., 1996;
Teper et al., 2013).

Mindfulness may help a person experience emotions in a healthy way because
both experiential avoidance and overengagement (e.g. rumination and worry) are
mitigated (Hayes & Feldman, 2004), leaving the person experiencing emotion in a
balanced way. Optimal social functioning and goal engagement are experienced in this
balanced space caused by well-regulated emotion (Schore, 2003).

For instance, a man may call in sick to work. Unfortunately, this person is prone
to anxious worry and subsequent avoidance. While he is at home resting, the phone
rings. A very subtle increase in both heart rate and alertness manifest in the person and
he wonders if it may be work that is calling. He sees his work’s phone number and his
heart rate increases as he begins to think worrisome thoughts: “what if they think I am not
sick?”; “why are they calling?”; “are they upset because they think I should have come
in?”. These thoughts may turn into “I’m probably in trouble, or even fired”.
Immediately, this catastrophizing, anxiety-ridden man decides not to answer the phone,
and go back to the movie he had on, all with the intention of avoiding his anxiety. Until
he goes back to work the next day, there is a background of worry that is polluting his
day of rest. Sometimes, this background worry emerges fully into catastrophizing, which
is then avoided by turning the television back on and his determination “not to think about it”. At any point in this sequence, mindfulness and acceptance could have helped attenuate the situation or even have fully stopped the entire unpleasant sequence. Simply, the present-centered orientation which a mindful person lives in is antithetical to past-oriented repetitive thought in rumination and future oriented repetitive thought in worrying.

If this is true, interventions which improve mindfulness can be used as an overarching treatment in people whose low emotion regulation and/or experiential avoidance are etiologically linked to their anxiety and/or depression. Clearly, not all depression and anxiety are caused and/or maintained by low emotion regulation and use of experiential avoidance, but in the cases that are, improving mindfulness may be quite helpful. A reduction in symptoms associated with depression and anxiety (worry and rumination), and reduction in self-reported depression and anxiety would be seen. This is, indeed, the case. In a sample of people seeking treatment for mood and anxiety disorders, worry mediated the relationship between low mindfulness and anxiety, and rumination mediated the relationship between low mindfulness and depression. This demonstrates that in both cases, being overly engaged in cognitions in a repetitive way is reduced when levels of mindfulness are increased via mindfulness training (Desrosiers, Vine, Klemanski, Nolen-Hoeksema, 2013).

Additionally, mindfulness has been shown to be positively correlated with vitality (Brown & Ryan, 2003), self-esteem (Brown & Ryan, 2003), optimism (Brown & Ryan,
2003; Hayes & Feldman, 2004), clarity of feelings (Hayes & Feldman, 2004), life satisfaction (Brown & Ryan, 2003), cognitive flexibility (Hayes & Feldman, 2004), pleasant affect (Brown & Ryan, 2003) and self-reported use of emotion regulation strategies (Feldman, Hayes, Kumar, Greeson, & Laurenceau 2007) and negatively correlated with depression (Brown & Ryan, 2003), social anxiety (Brown & Ryan, 2003), rumination (Kumar, Feldman, & Hayes, 2004; Hayes & Feldman, 2004), experiential avoidance (Kumar, Feldman, & Hayes, 2004; Hayes & Feldman, 2004), alexithymia (Baer et al., 2004) and stress reactivity in clinically anxious and non-anxious individuals (Arch & Craske, 2010; Bullis, Bøe, Asnaani, & Hofmann, 2014). All of these variables are directly or indirectly related to depression, anxiety, emotion regulation and experiential avoidance, factors which have all been demonstrated to be theoretically and empirically linked to people with substance use disorders.

Psychophysiological mechanisms of mindfulness are beyond the scope of this review, but should not be ignored. While this review focuses strictly on the psychological processes which mindfulness improves in the context of anxiety and depression, a growing body of literature on the psychophysiology of mindfulness exists (Keng, Smoski, & Robins, 2011).

To summarize, anxiety and depression are commonly comorbid with substance use disorders. Poor emotion regulation and high use of experiential avoidance are two factors which some consider to underlie substance abuse disorders, anxiety, and depression. Remission of a substance abuse disorder, then, does not mean improved
emotion regulation or less use of experiential avoidance, as there are many strategies of experiential avoidance. Understanding this, a population with substance use histories are still at risk for anxiety and depression. As mindfulness has been shown to improve anxiety and depression, investigation of whether or not this will extend to people with theoretical histories of low emotion regulation and high experiential avoidance should occur.

The purpose of this study is to contribute to that growing body of literature that examines mindfulness and the factors which promote it. More specifically, this study will explore whether or not mindfulness as measured by the Mindful Awareness Attention Scale (MAAS) is associated with positive mental health in people with self-reported histories of substance use disorders but who have sustained at least a full year of complete abstinence through regular 12-step participation. The first hypothesis is that mindfulness as measured by the MAAS will negatively correlate with depression as measured by the Center for Epidemiological Studies Depression Scale (CES-D). The second hypothesis is that mindfulness as measured by the MAAS will negatively correlate with anxiety as measured by the Generalized Anxiety Disorder 7 scale (GAD-7). The third hypothesis is that hours per month meditating will positively correlate with mindfulness as measured by the MAAS. The fourth hypothesis is that years as a meditator will positively correlate with mindfulness as measured by the MAAS.
CHAPTER 2

METHOD

Procedures

This is a cross sectional correlational design using snow ball and purposive sampling. Five long term members in the 12-step programs were contacted and were asked to advertise the study in whichever way they believed would reach the most potential subjects (e.g., mass e-mails, posting in a 12-step FaceBook group). All long-term members chose to advertise the study in either public or private FaceBook groups that were explicitly 12-step related. The advertised message was:

“I am a researcher at a Master's Level Clinical Psychology program at a California State University. In order to help understand people who are active participants in the 12-step process who have been abstinent for a year or longer, I want to ask you some questions. I really need your participation because you will help make a significant contribution to understanding our 12-step brothers and sisters. Please take the 10-15 minutes to fill out this survey. This study is anonymous, I will not even ask for your first name.”

Subjects were subsequently linked to an online survey created through qualtrics.com which they had unlimited time to complete. Subjects were not given any incentive other than helping increase knowledge on the subject of 12-step participants. As is standard with the institutional review board at California State University, Northridge, subjects were told they would be able to cease participation at any time with no repercussions. Additionally, all subjects were completely anonymous. The research was approved by the institutional review board at California State University, Northridge.

Participants
The inclusionary criteria for participation in the study was one year of abstinence from drugs and alcohol via 12-step participation and being at least 18 years of age. Of the people who saw the advertised study, 187 began the study. Data from a total of 135 adults who self-identified as being both abstinent from drugs and in recovery for a year or more were used, due to 52 subjects not consenting to act as a research participant. From this sample, 52.6% were men and 44.5% were women. Participants time sober ranged from 1-38.92 years ($M = 12.92$, $SD = 10.29$). The ethnic composition was as follows: 89.6% self identified as White/Caucasion; 1.5% Hispanic/Latino; 1.5 % African American/Black; .7% Middle Eastern or Armenian; 6.7% as two or more races. The age range was 20-72 years old ($M = 46.16$ years, $SD = 12.09$). There were 94 (69.6%) participants that self-reported practicing meditation while 25.9% reported not practicing meditation. Of the 94 participants who reported practicing meditation the following distribution indicates the number of years of estimated practice: less than 1 year was 4.4%; 1-3 years was 19.3%; 4-7 years was 14.8%; 8-10 years was 5.9% ; 11-15 years was 4.4%; 16-20 years was 7.4%; 21-30 years was 8.9%; 31-40 years was 4.4%; and 41-50 years was .7%.

Of the 94 participants who report practicing meditation, 47.91% of participants endorsed daily meditation, 41.66% endorsed weekly meditation, and 7.29% endorsed monthly meditation.

**Measures**
Mindful Awareness Attention Scale (MAAS; Brown & Ryan, 2003). Assessment of dispositional mindfulness was measured using the MAAS. The MAAS is a 17-item measure which uses a 6-point Likert-type scale where 1 = almost always; 2 = very frequently; 3 = somewhat frequently; 4 = somewhat infrequently; 5 = very infrequently 6 = almost never. Items were designed to assess the participant’s regular experiences regarding present-time awareness. An example of an item is “I do jobs or tasks automatically, without being aware of what I’m doing”. Cronbach’s Alpha is .92 for these data, demonstrating high reliability.

Generalized Anxiety Disorder - 7 (GAD-7; Spitzer, Kroenke, Williams, Lowe, 2006). Anxiety was measured using the GAD-7. Participants were directed to respond to the statement, “Over the last two weeks, how often have you been bothered by the following problems?” An example is “worrying too much about different things”. Response choices are in a 4-point Likert-type scale where 0 = Not at all; 1 = Several days; 2 = More than half the days; 3 = Nearly every day. Cronbach’s Alpha is .92 for these data, demonstrating high reliability.

Center for Epidemiological Studies Depression Scale (CES-D Scale, Lenore, Sawyer & Radloff, 1977). The CES-D scale is a 20-item measurement using a 4-point Likert-type scale where 0 = Rarely or None of the Time (Less than 1 Day); 1 = Some or a Little of the Time (1-2 Days); 2 = Occasionally or a Moderate Amount of Time (3-4 Days); 3 = Most of All of the Time (5-7 Days). Examples of items are “I felt lonely” and “I could not get ‘going’”. Cronbach’s Alpha is .90 for these data, demonstrating high
reliability. All answers are intended to reflect how the subject has felt or behaved in the past week, which is explicitly stated at the beginning of the protocol. This scale was chosen due to its creation for the general population rather than for a clinical population. While it can be argued that this population is subclinical, all participants were community members and were not found among specified clinical samples.
CHAPTER 3

RESULTS

The means and standard deviations for all variables using the entire sample of 12-step participants are reported in Table 1. Descriptive analyses were conducted using SPSS 22 for Mac OSX.

**Zero-Order Correlations**

Zero-order correlations (i.e., Pearson correlations) were used to investigate the strength and direction of the bivariate relationships between each independent and dependent variable. The means, standard deviations, and correlations for the sample are illustrated in Table 1.

As expected, mindfulness was significantly and negatively correlated to depression and anxiety, and significantly and positively correlated to years meditating. Additionally, mindfulness was significantly and positively correlated to years sober. Contrary to the hypothesis, average meditation duration was not significantly related to mindfulness.

**Linear Regression**

Linear regression analysis was used to test if the independent variables significantly predicted participants' ratings of anxiety. The results of the regression suggested the four predictors explained 38% of the variance ($F(4,80)=12.17, p<.001, R^2=.38$). The results indicate that mindfulness significantly predicted anxiety ($\beta = -.50, p<.001$). Results are displayed in Table 2.
Linear regression analysis was used to test if the independent variables significantly predicted participants' ratings of depression. The results of the regression suggested the four predictors explained 46% of the variance ($F(4,80)=17.11, p<.001, R^2=.46$). The results indicate that mindfulness significantly predicted depression ($\beta = -0.65, p<.001$). Results are displayed in Table 3.

Table 1
*Summary of Zero-Order Correlational Analyses on Long-Term 12-Step Participants’ Mindfulness, Generalized Anxiety, Depression, Years Sober, Years Meditating, and Average Meditation Duration (N = 135)*

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<tbody>
<tr>
<td>1. Mindfulness</td>
<td>1.00</td>
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<td></td>
<td></td>
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<tr>
<td>2. Generalized anxiety</td>
<td>-0.61**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Depression</td>
<td>-0.64**</td>
<td>0.74**</td>
<td>1.00</td>
<td></td>
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<td></td>
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<tr>
<td>4. Years sober</td>
<td>0.33**</td>
<td>-0.39**</td>
<td>-0.28**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Years meditating</td>
<td>0.29**</td>
<td>-0.35**</td>
<td>-0.17</td>
<td>0.73**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>6. Average meditation duration (hours per month)</td>
<td>0.15</td>
<td>-0.15</td>
<td>-0.15</td>
<td>0.23*</td>
<td>0.15</td>
<td>1.00</td>
</tr>
</tbody>
</table>

| $M$         | 4.19 | 11.59 | 13.29 | 12.92 | 10.07 |
| $SD$        | 0.9  | 4.57  | 9.60  | 10.29 | 12.25 |

*p < .05.  **p < .01

Table 2
*Summary of Linear Regression Analysis for Variables Predicting Anxiety (N = 135)*

<table>
<thead>
<tr>
<th></th>
<th>$B$</th>
<th>$SE B$</th>
<th>$\beta$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mindfulness</td>
<td>-2.46</td>
<td>0.46</td>
<td>-0.50</td>
<td>0.001</td>
</tr>
<tr>
<td>2. Years Sober</td>
<td>-0.16</td>
<td>0.06</td>
<td>-0.37</td>
<td>0.79</td>
</tr>
<tr>
<td>3. Years Meditating</td>
<td>-0.39</td>
<td>0.27</td>
<td>-0.19</td>
<td>0.16</td>
</tr>
<tr>
<td>Variable</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>P</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>1. Mindfulness</td>
<td>-6.4</td>
<td>0.87</td>
<td>-0.65</td>
<td>0.001</td>
</tr>
<tr>
<td>2. Years Sober</td>
<td>-0.08</td>
<td>0.11</td>
<td>-0.09</td>
<td>0.46</td>
</tr>
<tr>
<td>3. Years Meditating</td>
<td>0.22</td>
<td>0.51</td>
<td>0.05</td>
<td>0.67</td>
</tr>
<tr>
<td>4. Average Meditation Duration (hours per month)</td>
<td>-0.03</td>
<td>0.06</td>
<td>-0.04</td>
<td>0.61</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$</td>
<td>12.17**</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 3**

*Summary of Linear Regression Analysis for Variables Predicting Depression (N = 135)*
The purpose of this study was to examine the relationship between mindfulness, anxiety and depression in a sample of subjects with substance use histories who have maintained at least one year of abstinence via 12-step participation. The results indicate that mindfulness is negatively related to both anxiety and depression in this sample. The results from the present study are generally consistent with previous work showing the negative correlation between mindfulness and anxiety and depression among people without histories of substance use and subsequent 12-step participation (Brown & Ryan, 2003). The results of this study uniquely extend theory on the relationship between mindfulness, anxiety and depression to the “recovering” population.

Also, it was found that amount of time sober was positively related to mindfulness. Iudicello et al., (2010) found that stable abstinence for approximately one year was associated with improved neurocognitive abilities for people with historical methamphetamine addiction. According to four studies which used the MAAS, the mean MAAS score for adults is 4.20, whereas the mean for our study was 4.19. Dakwar, Mariani and Levin (2011) showed that non-intoxicated people with an active substance use disorder had lower than normal levels of mindfulness, except in the case of mono-addicted opiate users. This may indicate that protracted abstinence and/or 12-step participation can improve mindfulness deficits associated with or caused by substance use disorders.
Interestingly, whether or not the subjects reported having a meditation practice did not significantly relate to their mindfulness level as measured by the MAAS, nor did amount of hours spent practicing meditation per month. Although 12-step participants are encouraged to delve into the world’s libraries in order to try different meditation practices (Anonymous, pg. 99, 1955), it is uncertain whether or not a person will develop an explicit “mindfulness” practice. Fortunately, research has shown that different types of meditation or activities such as yoga increase mindfulness (Schoormans et al., 2011; Brisbon & Lowery, 2011).

In fact, although meditation clearly elevates mindfulness, it does not seem to be a requirement for increased mindfulness. In a study conducted by Brown and Ryan (2003), cancer patients had an elevated baseline MAAS score. The authors theorized that the experience of a potentially life-shortening illness can induce increased awareness of more presently-focused experiences and concerns (i.e. being more mindful). Brown and Ryan cite Brennan (2001) which suggests that people faced with a life-shortening illness sometimes reflect deeply on their behavior and social relationships, sometimes going through an intensive re-organization of life priorities and assumptions. When people consistently direct their attention and behavior towards that which they personally deem as truly important, they are engaged in “valued living” (Wilson, Sandoz, Kitchens, 2010). Indeed, Guadagno (2013) found that valued living mediated the relationship between mindfulness and well-being. This was because someone with enhanced mindful awareness had a greater ability to discern subtle internal cues which make one’s values
more salient. This of course would enable them to more clearly identify that which they
find truly meaningful and important and then actively engage life from that standpoint.
In effect, one’s values and behaviors become more congruent when one is living
mindfully.

This is a circumstance which resonates with the “recovery” experience in the lives
of people with histories of substance use disorders. It could be that 12-step groups and
work are an avenue where a re-exploration of one’s values, beliefs, behaviors, life
priorities and assumptions, create conditions where someone is regularly objectively
investigating their own thoughts and behaviors. Apart from formal meditation practices,
this medium might foster dispositional mindfulness through the above-mentioned
avenues. In their perspicacious article about anxiety sensitivity, experiential avoidance,
and substance use, Forsyth et al., (2003) acknowledges that “acceptance” is a core
concept of 12-step recovery, which once experienced, allows participants to “go to any
lengths” to recover. Even the prayer that participants say at the beginning of many 12-
step meetings, the “Serenity Prayer”, explicitly recommends acceptance, action, and the
ability to discern which is appropriate given the circumstances. These are qualities
counter to experiential avoidance and emotion dysregulation. Moreover, the oft-repeated
sayings, “one day at a time” and “just for today” demonstrate how a present-oriented
outlook is valued in 12-step groups. For these reasons, this population may unknowingly
endorse a strong relationship between qualities related to mindfulness (e.g. acceptance,
valued living) and mindfulness itself with both anxiety and depression. Subsequently,
sustained participation in activities which promote these ways of operating may account for the positive relationship between time sober and mindfulness.

Of those who did endorse having a meditation practice, years of practice was positively related to mindfulness scores. This is consistent with previous literature which demonstrates that amount of years as a meditation practitioner is positively associated with mindfulness (Brown & Ryan, 2003).

Further studies should examine how recovery process factors (e.g. acceptance) and length of time sober may relate to decreased experiential avoidance, increased emotion regulation skills and higher levels of mindfulness. Additionally, experimental studies should explore what effects a sustained, long-term meditation or mindfulness practice have on emotion regulation in people who have emotion regulation deficits. Further, how these effects may mediate the relationship between mindfulness, anxiety and depression should be investigated. Continued exploration should examine whether or not mindfulness training improves affect tolerance and decreases experiential avoidance in those who habitually avoid experience, as well as examining other factors which mediate the relationship between mindfulness and experiential avoidance. This may improve the understanding of mediating variables in the relationship between mindfulness, anxiety and depression.

Limitations of the study should not be under-appreciated. All scales were self-report measures. One potential limitation of the study is shared method variance which can inflate the size of the correlations between the independent and dependent variables.
Behavioral and biological markers can be used in replace of or in conjunction with self-report surveys to glean more objective data. Results were correlational and done in a cross-sectional design which decreased the ability to assert causality, thus future studies might want to include longitudinal design. There is clearly an over-representation of respondents who are Caucasian, which decreases the ability to generalize to other ethnic groups. Because the survey is online and the links weren't targeted to specific individuals, it is possible that people filled out the survey who did not meet the participation criteria.
References


from the 2008 Thai national mental health survey. *Addictive Behaviors, 37*(12),
1395-1399.

Teasdale, J. D. (1999). Emotional processing, three modes of mind, and the prevention of
relapse in depression. *Behaviour Research & Therapy, 37*, S53–S78.


sensitivity and emotion dysregulation in predicting anxiety-related cognitive and
affective symptoms. *Cognitive Therapy and Research, 32*(6), 803-817.

questionnaire: Defining and measuring valued action within a behavioral

Wong, C., Silva, K., Kecojevic, A., Schrager, S., Bloom, J., et al. (2013). Coping and
emotion regulation profiles as predictors of nonmedical prescription drug and
illicit drug use among high-risk young adults. *Drug and Alcohol Dependence,
132*(1-2), 165-171.

Zvolensky, M., & Schmidt, N. (2003). Panic disorder and smoking. *Clinical Psychology:
Science and Practice, 10*(1), 29-51.