ACCEPTANCE AND COMMITMENT THERAPY AND HEAVY EPISODIC DRINKING
AMONG COLLEGE STUDENTS:
AN EXAMINATION OF MECHANISMS OF CHANGE

A Thesis
by
JAMIE KIRKPATRICK

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Abstract

ACCEPTANCE AND COMMITMENT THERAPY AND HEAVY EPISODIC DRINKING
AMONG COLLEGE STUDENTS:
AN EXAMINATION OF MECHANISMS OF CHANGE

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Acceptance and Commitment Therapy (ACT) is a third-wave behavioral therapy that
uses acceptance- and mindfulness-based interventions and focuses on values. The main target
of ACT is increasing psychological flexibility. ACT has been shown to be effective in
treating a variety of problems, including substance use. However, little research has focused
on the mechanisms of change in the context of ACT and substance use. The present study
examined if psychological flexibility, distress tolerance, and mindfulness mediate the
effectiveness of an ACT-based intervention relative to a control condition on heavy episodic
drinking and alcohol-related problems among college freshmen who reported heavy episodic
drinking at baseline (N = 196). No significant differences emerged across time (baseline,
post-treatment, one-year follow-up) between the ACT and psychodidactic conditions on
heavy episodic drinking or alcohol-related problems. However, participants in both
conditions reported decreased heavy drinking and related problems across time. Indirect
analyses also indicated a lack of differences between conditions on mediator variables,

although there were increases in psychological flexibility, distress tolerance, and mindfulness across time. Similarly, psychological flexibility, distress tolerance, and nonjudgment of inner experience were negatively associated with alcohol-related problems. These findings suggest that preventive interventions can impact college student alcohol use and related problems as well as transdiagnostic mechanisms such as psychological flexibility. The present study was limited by the sensitivity of some of the measures and the timing of baseline measurement (i.e., prior to or at start of college) as well as the absence of a no-treatment control condition. Future research should examine ACT as a targeted, rather than prevention-focused, intervention for substance use in college students, particularly focusing on transdiagnostic mechanisms of change for substance use.

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Abstract

Acceptance and Commitment Therapy (ACT) is a third-wave behavioral therapy that uses acceptance- and mindfulness-based interventions and focuses on values. The main target of ACT is increasing psychological flexibility. ACT has been shown to be effective in treating a variety of problems, including substance use. However, little research has focused on mechanisms of change in the context of ACT and substance use. The present study examined if psychological flexibility, distress tolerance, and mindfulness mediate the effects of an ACT-based intervention relative to a control condition on heavy episodic drinking and alcohol-related problems among college freshmen who reported heavy episodic drinking at baseline ($N = 196$). No significant differences emerged across time (baseline, post-treatment, one-year follow-up) between the ACT and psychodidactic conditions on heavy episodic drinking or alcohol-related problems. However, participants in both conditions reported decreased heavy drinking and related problems across time. Indirect analyses also indicated a lack of differences between conditions on mediator variables, although there were increases in psychological flexibility, distress tolerance, and mindfulness across time. Similarly, psychological flexibility, distress tolerance, and nonjudgment of inner experience were negatively associated with alcohol-related problems. These findings suggest that preventive interventions can impact college student alcohol use and related problems as well as transdiagnostic mechanisms such as psychological flexibility. The present study was limited by the sensitivity of some measures and the timing of baseline measurement (i.e., prior to/at start of college) as well as the absence of a no-treatment control condition. Future research should examine ACT as a targeted rather than prevention-focused intervention for substance use in college students, particularly focusing on transdiagnostic mechanisms of change.

Acceptance and Commitment Therapy and Heavy Episodic Drinking Among College

Students:

An Examination of Mechanisms of Change

Acceptance and Commitment Therapy (ACT) is a third-wave cognitive behavioral

therapy that aims to "create a rich, full, and meaningful life while accepting the pain that

inevitably goes with it" (Harris, 2009, p. 7). The first wave of behavioral therapy began in the

1950s and 60s, and these therapies were purely behavioral, incorporating principles of

classical and operant conditioning. The second wave of behavioral therapy began in the

1970s and incorporated cognitive aspects to treatment. The third wave of behavioral therapy

began in the 1980s and is still developing. The third wave, which includes ACT (Hayes,

Wilson, Gifford, Follette, & Strosahl, 1996), incorporates mindfulness and acceptance into

traditional behavioral interventions (e.g., Cognitive-Behavioral Therapy [CBT]; Beck, 1993).

Other third-wave behavioral therapies include Dialectical Behavior Therapy (DBT; Linehan,

1993) and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale,

2001).

Cognitive and behavioral techniques, which are included in ACT, have been used for

case conceptualization, functional analysis, and treatment of substance use disorders

(McCrady, 2008; Higgins, Sigmon, & Heil, 2008). Further, many components of ACT (e.g.,

values and committed action, mindfulness, radical acceptance) correspond with special

considerations for substance abuse treatment such as motivation for change, dealing with

urges, and coping with negative emotional states (McCrady, 2008). However, there is a lack

of empirical evidence regarding the mechanisms of change in ACT for substance use.

Increased empirical investigation of mechanisms of change could facilitate the selection of treatment approaches and targets.

Processes of ACT. There are six core processes of ACT, which are contacting the present moment (i.e., being psychologically present and engaged in the moment), defusion (i.e., separating from thoughts and letting them come and go), acceptance (i.e., allowing negative thoughts and emotions to come and go without trying to push them away), self-as-context (i.e., observing the self with pure awareness), values (i.e., identifying what matters to the individual), and committed action (i.e., taking action that is guided by values; Hayes et al., 1996).

These six processes of ACT interact with each other to affect psychological flexibility, the main target of ACT. Psychological flexibility is defined as the ability to be in the present moment with awareness and openness to experience, in service of value-driven action (Harris, 2009). Further, the main target of ACT is not symptom reduction, but increases in psychological flexibility. Many different individual interventions (e.g., behavioral, acceptance-based, experiential exercises, metaphors) can be incorporated into ACT treatment (Hayes, 1996).

Effectiveness of ACT. Acceptance and Commitment Therapy has been shown to be effective in the treatment of several presenting problems including anxiety, depression, chronic pain, and somatic health problems (A-Tjak et al., 2015; Hacker, Stone, & MacBeth, 2016; Scott, Hann, & McCracken, 2016). For example, Hacker et al. (2016) conducted two meta-analyses: one included 28 randomized control trials (RCTs) for anxiety and one included 39 RCTs for depression. They found large pre-post treatment effect sizes ($d = .92$-

.95) as well as moderate effect sizes for active treatment group comparisons (ACT vs control; d = .45-.54) in reducing symptoms of anxiety and depression.

Similarly, A-Tjak et al. (2015) examined the effectiveness of ACT in comparison with control conditions, including treatment-as-usual (TAU), waitlist conditions, and other cognitive and behavioral interventions. They conducted a meta-analysis consisting of 39 RCTs that measured a variety of mental and physical health problems, including substance use. Results showed a moderate effect size favoring ACT interventions over other conditions as a whole, Hedges' g = .57, as well as small to moderate effects in ACT interventions from pre- to post-treatment (g = .54) and from pre-treatment to follow-up (g = .36; follow-up length ranged from 1.5 weeks to 18 months). Further, when each control condition was examined individually, ACT outperformed waitlist controls (g = .82), psychological placebo (g = .51), and TAU (g = .64). However, ACT demonstrated similar effectiveness to other active psychotherapies including cognitive-behavioral therapy, cognitive therapy, and exposure therapy (A-Tjak et al., 2015).

Treatment for Substance Use and Related Problems

Traditional treatment approaches. A variety of treatments target substance use disorders, and most providers use 12-step models, consistent with Alcoholics Anonymous (AA; Wilson, Hayes, & Byrd, 2000). The 12 steps and AA subscribe to a disease model and incorporate elements of spirituality (e.g., "higher power") into treatment (McCrady, 1993; 2008). Clients are expected to "work the steps" and attend 12-step meetings (Rotgers & Davis, 2006). AA explicitly provides peer social support for members, and is free and anonymous, making it readily accessible for underserved populations (McCrady, 1993).

However, it can be difficult to find therapists who provide treatment that drastically differs from the 12-step approach (Wilson et al., 2000), and there is a gap between empirically supported treatments, like CBT, and their dissemination and use in practice (Bagley, 2012). Some individuals seeking treatment for substance abuse do not identify with the 12-step model, which may impede treatment-seeking behaviors. For example, the 12-step approach follows an abstinence model and clients who are not completely ready for change may be resistant to this expectation. Further, previous research suggests that lifelong abstinence is generally difficult for individuals to attain (Rotgers & Davis, 2006).

Cognitive-behavioral therapy has emerged as an option for substance abuse treatment (Rotgers & Davis, 2006). CBT is based on learning theory and utilizes a behavioral approach in treatment. Behavioral techniques include goal-setting, functional analysis, skills training, and relapse prevention (Marlatt, 1996; Rotgers & Davis, 2006). CBT also tends to focus on collaboration with the client, ongoing assessment, and individualized treatment (Rotgers & Davis, 2006). There has been an ongoing controversy regarding CBT and 12-step treatment approaches, particularly concerning controlled drinking versus abstinence-only goals, with considerable pushback against controlled drinking (Marlatt, 1983; Wilson et al., 2000). Other incompatibilities between CBT and 12-step treatment include underlying theories (e.g., behaviorism versus morality/spirituality) and views on lapses/relapses. Client choice and program flexibility may be important in the context of substance use treatment. For example, Brown, Seraganian, Tremblay, and Annis (2002) randomized participants to a relapse prevention or 12-step group and found that participants who were matched with their treatment preference showed better outcomes for substance use and related impairments at six-month follow-up. Wilson et al. (2000) suggest that ACT may be an acceptable treatment

especially if there is a discrepancy between provider and client orientations (e.g., 12-step providers and clients who tend to be more secular or behaviorally oriented; Witkiewitz et al., 2014).

ACT as a treatment for substance use. An initial meta-analysis conducted by Lee, An, Levin, and Twohig (2015) examined the effectiveness of ACT for substance use disorders. Studies in the meta-analysis examined ACT as a treatment for a variety of substances including nicotine, heroin, methamphetamines, and polysubstance abuse. Aggregated findings suggested a small effect size ($g = .29$) favoring ACT over other treatments, including CBT, pharmacotherapy, and 12-step treatment for substance use outcomes. Furthermore, aggregated findings of substance use outcomes at follow-up showed a medium effect size ($g = .43$) favoring ACT over other treatments, although follow-up ranged from two to 12 months. This suggests that the positive effects of ACT may increase over time or they may deteriorate at a lower rate than other treatments.

Overall, however, few studies have examined the use of ACT in treating alcohol use and related problems. For example, Lee et al. (2015) included studies that examined alcohol in combination with other substances, but did not examine studies that focused on alcohol use and related problems. Further, as evidenced by a search on PsycINFO, many studies examining ACT and alcohol include comorbid concerns as well, such as mood disorders, and post-traumatic stress disorder.

Mechanisms of Change in ACT for Substance Abuse

ACT proposes that producing changes in psychological flexibility may in turn produce changes in symptoms, such as substance use and related problems. However, there is a lack of empirical evidence regarding the mechanisms that account for improvements in

substance use by using ACT or other treatments. For example, Wilson et al. (2000) suggested that substance use can be conceptualized as a form of experiential avoidance. Experiential avoidance is a phenomenon in which individuals attempt to avoid negative cognitions and emotions, and it has been shown to maintain psychopathology (Harris, 2009; Wilson et al., 2000). Mindfulness- and acceptance-based interventions have been shown to increase emotional regulation and decrease rumination and experiential avoidance in depression (Pots, Trompetter, Schreurs, & Bohlmeijer, 2016), but these mechanisms have not been well-studied with substance use. However, spirituality is a large component of AA, and spiritual growth (e.g., meditation and prayer) has been shown to mediate the relationship between AA and alcohol use (Witkiewitz, McCallion, & Kirouac, 2016). Further research is needed to examine other potential mechanisms of change in substance use treatment and with other interventions.

Psychological flexibility. As previously mentioned, the main target of ACT is increasing psychological flexibility, which involves contacting the present moment and aligning behaviors with values (Ciarrochi, Bilich, & Godsell, 2010). In a review of current literature, Ciarrochi et al. (2010) concluded that psychological flexibility has been empirically associated with an increase in psychological well-being, as well as symptom improvement for a variety of disorders (e.g., anxiety, substance use), despite the fact that psychological flexibility does not directly target symptoms. They further reported that psychological flexibility predicts future mental health severity in that greater psychological flexibility relates to less severe mental health concerns. Further, Pots et al. (2016) examined the effectiveness of ACT in treating depressive symptoms and found that a decrease in depressive symptoms was mediated by psychological flexibility and mindfulness.

Qualitative studies suggest that aspects of psychological flexibility uniquely impact symptom reduction in chronic pain patients participating in an ACT-based treatment (Trompetter, Bohlmeijer, Fox, & Schreurs, 2015). Trompetter et al. (2015) conducted a randomized control trial comparing an internet-based ACT intervention, expressive writing therapy, and a waitlist control for chronic pain. Results showed that ACT outperformed the expressive writing condition and the waitlist control for both increasing psychological flexibility and decreasing pain catastrophizing at post-treatment. Further, independent from pain catastrophizing, psychological flexibility was found to mediate changes in pain interference, psychological distress, and pain intensity (Trompetter et al., 2015). Additionally, Scott et al. (2016) found that psychological flexibility correlated with improvements in functioning as well as decreases in depressive symptoms in a sample of individuals with chronic pain.

Twohig, Whittal, Cox, and Gunter (2010) compared exposure and ritual prevention (ERP; an empirically supported behavioral treatment for obsessive-compulsive disorder [OCD]), cognitive therapy (CT), and ACT in treating patients with OCD. They also examined the processes theorized to underlie each of these psychotherapies (e.g., extinction in ERP, cognitive reappraisal in CT, and psychological flexibility in ACT). Among a sample size six participants diagnosed with OCD (two participants per group), four reported increases in psychological flexibility (e.g., two in the ACT group, two in the CT group). Of note, both participants in the ACT group experienced increases in psychological flexibility, with one experiencing increases only in psychological flexibility while the other experienced increases in all three mechanisms (e.g., psychological flexibility, extinction, and cognitive reappraisal). These results provide preliminary evidence suggesting that ACT works the way

it is proposed to work: through increasing psychological flexibility. However, this was a pilot study with a very small sample and further research is clearly needed to draw more definitive conclusions.

Overall, this literature indicates that psychological flexibility may be targeted by ACT and predictive of psychological disorders and their severity. Since psychological inflexibility has been shown to be closely related to experiential avoidance (Wolgast, 2014), and substance use has been conceptualized as experiential avoidance (Wilson et al., 2000), it is reasonable to consider that psychological flexibility is also related to substance use and related problems.

Distress tolerance. Distress tolerance can be defined as the ability to tolerate discomfort and negative emotional states (Brown et al., 2008). Distress tolerance (DT) is highlighted in transdiagnostic frameworks (Barlow et al., 2011; Frank & Davidson, 2014) and has been linked to greater risk of psychopathology, particularly emotional disorders and substance use disorders (Allan, Macatee, Norr, Raines, & Schmidt, 2015).

Negative emotional states are a reliable high-risk situation for relapse to substance use (Marlatt, 1996; Witkiewitz & Marlatt, 2007). As noted previously, Wilson et al. (2000) conceptualized substance use as an avoidance/escape strategy in response to negative emotional states, while persistence in tolerating distress was shown to be associated with increased durations of abstinence from drugs, alcohol, and cigarette smoking (Daughters et al., 2005). Further, low DT is related to an increased risk for relapse and early drop-out in residential substance abuse programs (Allan et al., 2015; Daughters et al., 2005; Brown et al., 2008).

Bornovalova, Gratz, Daughters, Hunt, and Lejuez (2012) conducted a preliminary RCT comparing a DT skills group, supportive counseling (SC), and TAU for individuals with substance use disorders. Results showed that the DT group showed significantly greater improvements in DT, as measured by behavioral tasks, while SC showed decreases and TAU showed no change in DT. Bornovalova et al. (2012) also found that 40.7 percent of the participants in the DT skills group showed improvement in DT, compared to 13 percent of the SC group and 18.2 percent of the TAU groups.

Acceptance in ACT could potentially target DT (Brown et al., 2013). Brown et al. developed a DT treatment for smoking cessation that incorporated exposure to distress and ACT. They conducted a RCT and found that participants in the DT treatment group were significantly more likely to be abstinent pre- to post-treatment than the standard treatment group, which consisted of self-monitoring, identifying triggers, developing coping strategies, and relapse prevention. Although they did not independently measure DT, Brown et al. (2013) measured psychological flexibility using the Acceptance and Action Questionnaire – II (AAQ – II) as well as a smoking-specific measure of experiential avoidance. They found that participants in the ACT group displayed greater decreases in smoking-specific experiential avoidance than the standard group, but both groups showed similar decreases in overall psychological flexibility as measured by the AAQ.

Similarly, Brown et al. (2008) investigated an ACT intervention that incorporated behavioral monitoring, exposure, and DT for participants identified as early-lapse smokers (e.g., had never had a quit attempt last longer than 72 hours). Smoking status for each participant was measured at post-treatment and 8-, 13-, and 26-week follow-up, with results showing that early lapse smokers sustained significantly longer periods of abstinence than

they had in the past ten years. Brown et al. (2008) also suggested that participants'

persistence in attending treatment provided indirect evidence for increased DT. In this study,

Brown et al. examined smoking outcomes, but did not include process measures such as DT.

Further, Brown et al. (2008) only examined pre-post outcomes and did not include a control

group.

Distress tolerance skills, and the ability to cope with negative thoughts and emotions,

have been tested in treatment studies, both in isolation and combined with ACT. Further,

persistence in the face of distress relates to duration of substance use abstinence (Daughters

et al., 2005). However, no studies were found that used a self-report measure of DT or

examined DT as a mediator of an ACT intervention in the context of substance use. Further

examination of this relationship is needed to support the use of DT skills used in conjunction

with ACT as a treatment for substance use and related problems.

Mindfulness. Mindfulness, a primary tenet of ACT, has shown positive results in the

treatment of substance use disorders (Lee et al., 2015). Mindfulness means "paying attention

with flexibility, openness, and curiosity" (Harris, 2009, p. 8). Mindfulness interventions

teach clients to pay full attention to internal and external experiences, and to be open to

experience (Chiesa & Serretti, 2014). In a meta-analytic review, Chiesa and Serretti (2014)

examined 24 studies comparing mindfulness-based interventions and a control/comparison

condition, 14 of which were RCTs. Results showed that mindfulness-based interventions,

such as ACT and mindfulness-based relapse prevention (MBRP; Bowen, Chawla, & Marlatt,

2011), led to decreases in substance use to a significantly higher extent than waitlist controls

and support groups. Mindfulness has been shown to be safe, satisfying to clients, and may

have long-lasting effects (Zgierska & Marcus, 2010).

Harm reduction programs focus on reducing the negative consequences of substance use and setting goals to use in moderation and in safe conditions (Bayles, 2014). Mindfulness-based relapse prevention (Bowen et al., 2011) began as a harm reduction protocol used to reduce the risk of relapse after substance abuse treatment (Bowen & Vieten, 2012). Mindfulness-based relapse prevention incorporates mindfulness exercises with cognitive-behavioral techniques, and has shown to be more effective in treating substance abuse (e.g., alcohol, cocaine/crack) than traditional 12-step programs (Bowen & Vieten, 2012). As an extension of MBRP, Vieten, Astin, Buscemi, and Galloway (2010) developed an acceptance-based relapse prevention (ABRP) program designed to increase DT and decrease experiential avoidance, but has also been shown to improve negative affect, emotional reactivity, and mindfulness level (Bowen & Vieten, 2012).

Craving, an automatic process that often accompanies substance use disorders and negative affect, is strongly predictive of relapse (Ostafin & Marlatt, 2008; Witkiewitz, Lustyk, & Bowen, 2013). Mindfulness exercises target these automatic responses, and Marlatt referred to the mindfulness and acceptance of these automatic processes as "urge surfing" (Marlatt & Gordon, 1985; Ostafin & Marlatt, 2008). Ostafin and Marlatt (2008) found that higher levels of acceptance and mindfulness led to a decrease in heavy alcohol consumption in a sample of college students who drink, possibly by changing the relationship between automatic responses and drinking behavior by increasing adaptive responding.

Mindfulness interventions have also been shown to increase coping skills and self-efficacy (Bowen & Vieten, 2012), and decrease symptoms of depression and anxiety, experiential avoidance, and stress, which are significant predictors of relapse to substance use (Chiesa & Serretti, 2014; Marcus & Zgierska, 2009). Zgierska and Marcus (2010) also found

that mindfulness practice is associated with improved sleep, improved psychological health, and reduced substance abuse. Further, Witkiewitz et al. (2014) hypothesized that mindfulness training could impact internal risk factors for relapse such as lack of awareness and a tendency toward judgmental thinking styles. It was also hypothesized to reduce craving, negative affect, and reactive responses to stress.

Mindfulness practices are used in several types of psychotherapy including ACT, DBT, MBRP, and mindfulness-based cognitive therapy. Greater levels of mindfulness have been shown to relate to reductions in substance use, cravings, negative affect, and experiential avoidance, as well as improvements in DT and coping. However, mindfulness levels have not been examined as a mediator of substance use in the context of ACT.

Present Study

The current study examines if psychological flexibility, DT, and mindfulness mediates the effectiveness of an ACT-based intervention relative to a control intervention on heavy episodic drinking and alcohol-related problems with college freshmen. College students typically report high levels of alcohol use; for example, Velazquez et al. (2011) found that 62-70% of college students reported using alcohol within the past month, and 78-81% reported using alcohol within the past year. Velazquez et al. (2011) further found that 26-32% of college students reported at least one episode of heavy drinking in the past two weeks. Not only do a large percentage of college students drink alcohol, they also experience consequences because of drinking, including academic problems, health-related problems, injuries, and unsafe sex (National Institute on Alcohol Abuse and Alcoholism, 2015).

Review of the current literature suggests that ACT may be an effective treatment for substance use (Lee et al., 2015). However, the mechanisms through which ACT may

effectively target substance use have not been well investigated. Lower psychological flexibility has been shown to be related to the development and severity of disorders including anxiety, depressive disorders, and substance use and related problems (Ciarrochi et al., 2010) has been shown to mediate ACT and symptoms of chronic pain (Trompetter et al., 2015). While lower DT has been shown to be related to increased risk of relapse (Allan et al., 2015), treatments that incorporate ACT and DT have been shown to increase periods of abstinence in early-lapse smokers (Brown et al., 2008; 2013). However, no literature was found that included a self-report measure of DT or mediational analyses. Finally, mindfulness-based interventions (e.g., ACT, MBRP) have been effectively used in treatments for substance use, and greater levels of mindfulness have been associated with a variety of positive effects (Bowen & Vieten, 2012; Chiesa & Serreti, 2014; Ostafin & Marlatt, 2008; Zgierska & Marcus, 2010). However, no research was found that independently measured mindfulness or examined it as a mediator in the context of ACT interventions relative to alcohol use.

As previously noted, alcohol use, particularly heavy drinking, is high in the college student population. Additionally, ACT has been shown to be an effective treatment for substance use. However, there is little research that examines ACT as an intervention for heavy episodic drinking in college students. Further, there has been little investigation into mechanisms that may mediate the relationship between ACT and substance use outcomes. Additionally, given the known predictors of substance use, it is likely that increases in psychological flexibility, DT, and mindfulness in the context of ACT may drive decreases in alcohol use and related problems.

The current study examines heavy episodic drinking outcome data as well as mediational variables of psychological flexibility, DT, and mindfulness in the context of a large RCT in which college freshman were randomized to a brief general ACT intervention or a brief general psychoeducation intervention. It is hypothesized that:

1. Participants in the ACT group will show significant decreases in heavy episodic drinking and related problems in comparison to the control condition.

2. Psychological flexibility will mediate the effects of the ACT intervention on heavy episodic drinking and problems.

3. Distress tolerance will mediate the effects of the ACT intervention on heavy episodic drinking and problems.

4. Mindfulness will mediate the effects of the ACT intervention on heavy episodic drinking and problems.

Method

Participants

Participants consisted of 732 incoming college freshmen, who were, on average, 18.1 years old ($SD = 0.49$). Sixty-two percent of the participants were female, and 67% identified as White non-Hispanic. Thirteen percent identified as Hispanic, 8% identified as Asian/Asian American, 3.7% identified as African American, and 12.3% identified as other or multiracial. Almost 21% of participants met criteria for a psychological disorder, based on the Structured Clinical Interview for the DSM-IV-TR, Non-Patient Edition (SCID-I/NP; First, Spitzer, Gibbon, & Williams, 2002), with 3.5% having a mood disorder, 13.9% having an anxiety disorder, and 6.1% having a substance use disorder. Graduate students and post-doctoral fellows conducted the interviews after receiving 20 hours of training, and reliability between

raters was maintained at least at 0.8. Throughout the study, the interviewers received

supervision from licensed psychologists and participated in booster training sessions. This

study received IRB approval from the University of Nevada at Reno as well as IRB approval

via exemption from Appalachian State University due to the use of anonymized archival

data.

Measures

   Demographics. A face valid pre-intervention demographic questionnaire assessed

age, nationality, race/ethnicity, gender, and whether participants were born in the United

States. See Appendix A for the demographics measure.

   Psychological flexibility. Psychological flexibility was measured using the

Acceptance and Action Questionnaire–II (AAQ-II). The AAQ-II consists of ten items that

are rated on a scale ranging from 1 (never true) to 7 (always true), with higher scores

indicating higher psychological flexibility (Hayes et al., 2004). Seven items are reverse

coded, and the total score is summed and ranges from 10 to 70. Items include "I'm afraid of

my feelings" and "My painful memories prevent me from having a fulfilling life." Alpha

coefficients for the AAQ-II range from .78 to .88, and test-retest reliabilities was .81 at 3

months and .79 at 12 months. The correlation between the AAQ-II and the AAQ-I is .97,

suggesting a high level of convergent validity (Bond et al., 2011). The alpha coefficient for

the AAQ was .87 among the sample used in the present study. Of note, the version used in

this study differs from the traditional AAQ-II, which only includes the seven reverse-coded

items (Bond et al., 2011). See Appendix B for the AAQ – II.

   Distress tolerance. Distress tolerance was measured using the Distress Tolerance

Scale (DTS; Simons & Gaher, 2005). The DTS consists of 15 items that are rated on a Likert

scale ranging from 1 (strongly agree) to 5 (strongly disagree). The DTS scores are calculated

by averaging the items in each of four subscales; the total scale score is derived by averaging

scores on the four subscales and range from 1 to 5. Higher scores indicate higher levels of

DT.

Four subscales are supported by factor analysis, which also identified a second-order

factor for overall DT (Simons & Gaher, 2015). The subscales of the DTS include: tolerance

(i.e., ability to tolerate emotional distress), absorption (i.e., attention being absorbed by

negative emotions), appraisal (i.e., subjective appraisal of distress), and regulation (i.e.,

efforts to avoid emotional distress). The tolerance subscale consists of 3 items ($\alpha = .72$;

"Feeling distressed and upset is unbearable to me"), absorption consists of 3 items ($\alpha = .78$;

"When I feel distressed or upset, all I can think about is how bad I feel"), appraisal consists

of 6 items ($\alpha = .82$; "My feelings of distress or upset are not acceptable"), and regulation

consists of 3 items ($\alpha = .70$; "I'll do anything to avoid feeling distressed or upset"). In this

study, an average of the total score, ranging from one to five, was used.

The alpha coefficient for the total score of the DTS is estimated at .89. When

correlated with other measures of affective functioning, the DT displayed adequate

convergent and discriminant validity (Simons & Gaher, 2005). The alpha coefficient for the

DTS for the current sample was .90. See Appendix C for the DTS.

Mindfulness. Level of mindfulness was assessed using the Five Facets of

Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006).

The FFMQ consists of 39 items that are rated on a 5-point Likert scale ranging from 1 (never

or very rarely true) to 5 (very often or always true). Nineteen items are reverse coded. The

FFMQ consists of five subscales. Observing items include "I notice how my emotions

express themselves through my body" and "I pay attention to sensations, such as the wind in my hair or sun on my face." Describing items include "I'm good at finding the words to describe my feelings" and "It's easy for me to keep track of my thoughts and feelings." Acting with awareness items include "I find it difficult to stay focused on what's happening in the present" and "I am able to pay close attention to one thing for a long period of time." Nonjudging of experience items include "I criticize myself for having irrational or inappropriate emotions" and "I make judgments about whether my thoughts are good or bad." Nonreactivity to inner experience items include "I perceive my feelings and emotions without having to react to them" and "Usually when I have distressing thoughts or images, I just notice them and let them go."

Alpha coefficients for the FFMQ range from .75 to .91: observing (8 items, α = .83), describing (8 items, α = .91), acting with awareness (8 items, α = .87), nonjudgment of inner experience (8 items, α = .87), and nonreactivity to inner experience (7 items, α = .75). Hierarchical confirmatory factor analyses suggest that at least four of the factors contribute to an overall mindfulness construct. The FFMQ has exhibited incremental validity in predicting psychological symptoms (Baer et al., 2006).

Previous literature has suggested that groups of college students who are high in all five facets of mindfulness, as measured by the FFMQ, had the most adaptive mental health outcomes (e.g., symptoms of depression, anxiety, PTSD, suicidality, and alcohol use), while students who are low in all facets of mindfulness reported more maladaptive mental health outcomes (Bravo, Pearson, & Kelley, 2017). Ramler, Tennison, Lynch, and Murphy (2016) tested a mindfulness-based intervention on first-year college student adjustment and measured mindfulness using the FFMQ. They examined each subscale separately and found

that the intervention predicted improvement on three out of the five subscales (e.g.,

observing, describing, and nonreactivity to inner experience) and contributed to positive

adjustment in first-year college students. Consistent with previous literature, each subscale of

the FFMQ was examined separately in the present investigation. Scores are summed for each

subscale, with higher scores indicating higher levels of mindfulness. In the current sample,

alpha coefficients ranged from .78 to .91: observing ($\alpha = .78$), describing ($\alpha = .88$), acting

with awareness ($\alpha = .88$), nonjudgment of inner experience ($\alpha = .91$), and nonreactivity to

inner experience ($\alpha = .79$). See Appendix D for the FFMQ.

   Alcohol use. Heavy episodic drinking was assessed using questions from the

Monitoring the Future Survey (MTF). The MTF survey consists of 11 items assessing drug

and alcohol use across the past 30 days (Bachman, Johnston, O'Malley, & Schulenberg,

2001). The present study included one question about alcohol use that assessed episodes of

heavy drinking: "During the past 30 days, on how many days did you have 5 or more drinks

of alcohol in a row, that is, within a couple of hours?" This item was answered on an ordinal

scale ranging from zero ("0 times") to six ("20 or more days"), with higher numbers

indicating relatively higher levels of self-reported heavy episodic drinking.

   Previous findings support the reliability and validity of self-report measures of

substance use. Borsari and Muellerleile (2009) conducted a meta-analysis examining

agreement between self-reports and collateral reports of alcohol use in college students and

found that individuals report greater substance use than their collateral informants (i.e.,

reporting on their observations of the individual's use). See Appendix E for the MTF survey.

   Alcohol-related problems. Alcohol-related problems were assessed using the

Rutgers Alcohol Problem Inventory (RAPI). The core prompt in the RAPI is "How many

times has this happened to you while you were drinking or because of your drinking during

the last 10 weeks?" This question is followed by 23 items that are rated on a 4-point Likert

scale whereby "0" indicates "none" and "3" indicates "More than 5 times." Each item

response is summed to comprise a scale ranging from 0 to 69, with higher scores indicating

more alcohol-related problems (White & Labouvie, 1989b). Items include "Not able to do

your homework or study for a test" and "Wanted to stop drinking but couldn't." The RAPI is

commonly used with college students, and demonstrates a test-retest reliability coefficient of

.80 or higher in clinical and non-clinical samples as well as an internal consistency of .92.

Correlations between the RAPI and alcohol use intensity resulted in convergent validity

coefficients ranging from .20 to .57 (White & Labouvie, 1989a). In the current sample, the

alpha coefficient for the RAPI was .83. See Appendix F for the RAPI.

Design and Procedure

Between 2008 and 2010, four recruitment cycles were conducted via email, aimed at

all incoming freshmen attending a medium-sized university in the Western part of the United

States ($n = 5,907$). Prospective participants were asked to complete the AAQ-II as a

screening measure. Approximately 39% of participants completed the survey and were

entered in a drawing to win an iPod or a cash prize. Recruitment was conducted in waves,

and participants who scored above the gender-specific cutoff score for the AAQ – II (e.g.,

total score of 57 for males, 55 for females), indicating lower psychological flexibility, were

invited to participate in the first wave. About one month later, students who received scores

indicating higher psychological flexibility were invited to participate.

For those who consented to participate ($n = 817$), the assessment process took place

in two sessions. In the first session, participants consented to participation and completed a

series of clinical interviews and behavioral tasks. The second session, which occurred a few

weeks later, consisted of the participants completing online questionnaires, including the

self-report measures used in this study. The participants were also given $20 as compensation

for their time for completing baselines measures. Approximately 10% of students (85

individuals) did not attend the second session and were not randomized.

After baseline assessment, the total sample consisted of 732 participants. Each

consenting participant was required to register for a free "class" that would serve as the

experimental and control groups. On the first day of class, consenting participants completed

baseline questionnaires and were randomized to either an ACT class or a Psychodidactic

class.

 These two classes were conducted at the same time on the same day, for two hours weekly,

for eight weeks. The first and last class consisted of baseline and post-treatment assessment.

The ACT class modified traditional ACT for use with college students, while the

Psychodidactic class consisted of freshman orientation skills (e.g., stress management,

budgeting, communicating with professors, etc.). The baseline questionnaires and a quiz on

class content were administered during the last meeting. Participants also completed a one-

year follow-up assessment.

ACT intervention. The ACT class was designed to cover content from the book *Get

Out of Your Mind and Into Your Life* (Hayes & Smith, 2005), which is designed for general

use by the public. This book explains and reviews ACT processes and has been used in

empirical investigations of ACT. Chapters of this book include topics such as human

suffering and language, avoidance, acceptance and willingness, helpful and unhelpful

thoughts, sense of self, mindfulness, and values and committed action. All participants were

provided with a copy of the book. The class consisted of mostly discussion with some experiential exercises.

The first class included a discussion about prevention of mental health difficulties and adjustment to college life, as well as discussion of suffering and how language contributes to suffering. The second class consisted of values work, the role of experiential avoidance, and acceptance. The third and fourth classes focused on cognitive defusion, and the idea of the self and how we define ourselves. The fifth class focused on mindfulness, and the sixth class focused on willingness. The seventh and eighth class included values clarification and committed action.

Psychodidactic intervention. The control condition utilized a book created for this study titled *The Cornerstone and Keys to Successful Learning: Adjustment to College and Life* (Prentice Hall, 2008). This book consists of several modules that covered topics taught in other freshmen orientation classes: change; persistence; critical, creative, and practical thinking; prioritization; personal wellness and managing stress; relating to others and communicating with professors; and managing money and a career. All participants were provided with a copy of the book. The class consisted mostly of structured PowerPoint lectures.

The first class focused on adjustment to college life and study habits, and the second class focused on rational thinking and self-concept. The third class focused on social relationships, while the fourth class discussed intimate relationships. The last four classes focused on gender roles, age roles and development, job hunting and employment, and health habits.

Therapists and treatment fidelity. The ACT class was conducted by clinical psychology doctoral students, with at least one year of experience in ACT, under the supervision of the developer of ACT, Dr. Steven C. Hayes. The Psychodidactic class was taught by psychology doctoral students who received supervision from faculty in counseling educational psychology. Both classes were evaluated by three independent raters on adherence to treatment protocols and displayed averages of 96-97% adherence to protocols in both groups and across raters.

Results

Data analysis was conducted using SPSS (IBM Corp., 2013; Version 22.0). Participants were removed if they did not endorse drinking at baseline as it would be impossible to detect a change in drinking across time if baseline abstainers were included; participants were also removed if they did not complete the class (defined as attendance of at least five classes). Of the original 732 participants, 670 participants completed one of the classes; of these, 196 endorsed heavy episodic drinking at baseline with 92 participants in the ACT condition and 104 participants in the psychodidactic condition. The final sample had an average age of 18.1 years ($SD = 0.43$) and there were no demographic differences between the total sample and the sample of baseline drinking endorsers (all p's > .05). See Table 1 for demographic statistics.

Data Preparation

The data was first prepared by running exploratory descriptive statistics to examine the normality of the distributions for the outcome and mediator variables. The data was assessed for linearity by examining correlations and scatterplots. The means for each group were plotted and examined on each variable. The residuals from the data were plotted on a

histogram to assess for normality and homoscedasticity. There were no violations of

normality large enough to require transformation of the data. Correlations were calculated to

examine the relationship between the measures at baseline (see Table 2).

In the last stage of data preparation, independent-samples t-tests were conducted to

examine the similarity of the ACT group and the control group on baseline mediating and

outcome variables to test for the effectiveness of random assignment. Separate t-tests were

conducted; no significant differences were found on the following variables: AAQ-II,

$t(192) = -0.60$, $p = .552$; DTS, $t(185) = -1.10$, $p = .274$; FFMQ, $t(189) = -0.30$, $p = .763$;

and RAPI, $t(193) = 1.42$, $p = .158$. Given the ordinal nature of the heavy episodic drinking

item (e.g., "0" = 0 days; "1" = 1 day; "2" = 2 days; "3" = 3 to 5 days; "4" = 6 to 9 days;

"5" = 10 to 19 days; "6" = 20 or more days), a Mann-Whitney test was conducted,

$U = 3935.50$, $p = .026$, that did show significant differences at baseline. These results

indicate that the ACT group ($M = 2.33$, $SD = 1.15$) endorsed higher levels of heavy episodic

drinking at baseline relative to the psychodidactic control group ($M = 2.07$, $SD = 1.25$);

therefore, the following analyses control for this baseline difference. See Table 3 for

descriptive statistics.

ACT Intervention and Substance Use and Related Problems

Outcome analyses. To test the hypothesis that the ACT intervention would

outperform the psychodidactic class in reducing heavy episodic drinking and RAPI scores,

six independent-samples t-tests examining whether the ACT intervention group differed from

the control condition on the two outcomes measures. T-tests were conducted for each

variable for two time points, using pre- to post-treatment change scores, pre-treatment to

follow-up change scores, and post-treatment to follow-up change scores. Change scores were

derived by subtracting pre-treatment scores from post-treatment and follow-up scores, and post-treatment scores from follow-up scores, respectively. See Table 4 for descriptive statistics of change scores.

Results of outcome t-tests suggest that there were not significant differences between the ACT group and the psychodidactic group on heavy episodic drinking from pre- to post-treatment, $t(189) = -1.36$, $p = .177$; from pre-treatment to follow-up, $t(176) = -0.46$, $p = .644$; or from post-treatment to follow-up, $t(173) = 0.79$, $p = .430$. Given that change scores do not necessarily control for between-group differences at baseline (Vickers & Altman, 2001), an ANCOVA was also conducted using heavy episodic drinking at baseline as the covariate; while ANCOVAs typically use continuous covariates, Rutherford (2012) reported that ANCOVAs can include continuous and categorical variables and suggested that covariates may sometimes be ordinal. Similar to t-tests, results of the ANCOVA suggested that there was not significant differences in heavy episodic drinking between groups from pre- to post-treatment, $F(1,172) = 0.73$, $p = .393$; from pre-treatment to follow-up, $F(1,172) = 0.12$, $p = .729$; or from post-treatment to follow-up, $F(1,172) = 0.97$, $p = .327$, even when controlling for baseline drinking. Similarly, significant differences were not found on the RAPI from pre- to post-treatment, $t(188) = -1.21$, $p = .226$; from pre-treatment to follow-up, $t(175) = -1.18$, $p = .241$; or from post-treatment to follow-up, $t(172) = 0.09$, $p = .925$.

Although not included in the original analysis plan, 2 x 3 mixed model Analyses of Variance (ANOVAs) were also conducted as exploratory analyses to examine whether there was a significant interaction between condition (ACT and psychodidactic) and time (pre-treatment, post-treatment, follow-up) on each of the outcome variables. Results suggested

that there was a significant within-subjects effect of time, $F(2,172) = 7.02$, $p = .001$,

$\eta_p^2 = .039$, in which heavy episodic drinking decreased significantly from pre-treatment

($M = 2.19$, $SD = 1.21$) to post-treatment ($M = 1.94$, $SD = 1.49$), $p = .008$, and from pre-

treatment to follow-up ($M = 1.78$, $SD = 1.58$), $p = .001$, but did not change from post-

treatment to follow-up, $p = .197$. Consistent with initial outcome t-tests, there was no main

effect of condition, $F(1,173) = 0.93$, $p = .337$, $\eta_p^2 = .005$. Additionally, within-subjects tests

suggest that there was not a significant interaction between condition and time on heavy

episodic drinking outcomes, $F(2,172) = 0.62$, $p = .540$, $\eta_p^2 = .004$.

Similarly, a mixed model ANOVA was conducted using the RAPI as the dependent

variable. Results suggest that there was also a significant main effect of time,

$F[2,171] = 4.26$, $p = .015$, $\eta_p^2 = .024$, on the RAPI in which scores, while not changing

significantly from pre- to post-treatment ($p = .684$), did significantly decrease from pre-

treatment ($M = 3.86$, $SD = 4.65$) to follow-up ($M = 2.94$, $SD = 3.47$), $p = .006$, and from post-

treatment ($M = 4.06$, $SD = 5.99$) to follow-up, $p = .012$. However, results did not show a

main effect of condition, $F[1,172] = 0.26$, $p = .613$, $\eta_p^2 = .001$, nor a significant interaction

between condition and time with regard to the RAPI, $F[2,171] = 1.01$, $p = .366$, $\eta_p^2 = .006$.

Mediator analyses. Given that significant differences between groups were not

found, a Multivariate Analysis of Variance (MANOVA) was used to examine the

relationship between the condition and the mediators, and correlations were used to examine

the relationship between the mediators and drinking outcomes. These results tested whether

the intervention had an indirect relationship with alcohol use and problems through the

proposed mediators.

To test the hypothesis that the ACT intervention would outperform the psychodidactic class in increasing scores on the AAQ-II, DTS, and the five subscales of the FFMQ, a 2 (ACT vs. psychodidactic) x 3 (time: baseline, post, one-year follow-up) mixed-model MANOVA was conducted on dependent mediator variables. Similar to outcome variables, tests of between-subjects effects show no significant differences between conditions on any of the mediator variables: AAQ-II, $F(1,149) = 0.27$, $p = .605$, $\eta_p^2 = .002$; DTS, $F(1,149) = 0.56$, $p = .457$, $\eta_p^2 = .004$; FFMQ observing, $F(1,149) = 0.00$, $p = .960$, $\eta_p^2 = .000$; FFMQ describing, $F(1,149) = 0.49$, $p = .487$, $\eta_p^2 = .003$; FFMQ acting with awareness, $F(1,149) = 1.92$, $p = .168$, $\eta_p^2 = .013$; nonjudgment of inner experience, $F(1,149) = 0.97$, $p = .326$, $\eta_p^2 = .006$; nonreactivity to inner experiences, $F(1,149) = 0.41$, $p = .523$, $\eta_p^2 = .003$. The interaction between time and intervention condition was also insignificant, Pillai's statistic $= .06$, $F(14, 586) = 1.36$, $p = .168$, $\eta_p^2 = .031$.

However, a significant multivariate effect of time emerged, Pillai's statistic $= .20$, $F(14,586) = 4.56$, $p < .001$, $\eta_p^2 = .098$. Overall, AAQ-II scores increased over time, $F(2,298) = 7.79$, $p = .001$, $\eta_p^2 = .050$; specifically, while AAQ scores did not show a significant increase from pre- to post-treatment, $p = .229$, they did increase significantly from pre-treatment ($M = 53.02$, $SD = 9.37$) to follow-up ($M = 54.95$, $SD = 8.83$), $p = .010$, and from post-treatment ($M = 52.32$, $SD = 9.45$) to follow-up, $p = .001$. Similarly, DTS scores increased over time, $F(2,298) = 10.19$, $p < .001$, $\eta_p^2 = .064$; in particular, DTS scores increased significantly from pre-treatment ($M = 3.79$, $SD = 0.75$) to post-treatment ($M = 3.99$, $SD = 0.75$), $p < .001$, and from pre-treatment to follow-up ($M = 4.04$, $SD = 0.75$), $p < .001$, but not from post-treatment to follow-up, $p = .391$.

Further, scores on each of the subscales of the FFMQ increased over time with the

exception of observing, $F(2,298) = 1.72$, $p = .181$, $\eta_p^2 = .011$; describing, $F(2,298) = 12.03$,

$p < .001$, $\eta_p^2 = .075$; acting with awareness, $F(2,298) = 3.70$, $p = .026$, $\eta_p^2 = .024$;

nonjudgment of inner experience, $F(2,298) = 6.43$, $p = .002$, $\eta_p^2 = .041$; nonreactivity to inner

experience, $F(2,298) = 4.11$, $p = .017$, $\eta_p^2 = .027$. While the describing subscale scores did

not significantly increase from pre- to post treatment, $p = .064$, they did increase significantly

from pre-treatment ($M = 28.32$, $SD = 6.36$) to follow-up ($M = 29.64$, $SD = 5.97$), $p = .003$,

and from post-treatment ($M = 27.55$, $SD = 6.04$) to follow-up, $p < .001$. The acting with

awareness subscale scores only increased from post-treatment ($M = 27.36$, $SD = 5.97$) to

follow-up ($M = 28.48$, $SD = 5.76$), $p = .009$, but did not significant increase from pre- to

post-treatment, $p = .059$, or from pre-treatment to follow-up, $p = .436$. Nonjudgment of inner

experience scores increased from pre-treatment ($M = 29.88$, $SD = 6.64$) to follow-up

($M = 31.46$, $SD = 6.29$), $p = .002$, and from post-treatment ($M = 30.03$, $SD = 6.52$) to follow

up, $p = .005$, but not from pre- to post-treatment, $p = .740$. Similarly, nonreactivity to inner

experience scores also increased from pre-treatment ($M = 22.14$, $SD = 4.96$) to follow-up

($M = 22.93$, $SD = 5.70$), $p = .040$, and from post-treatment ($M = 21.77$, $SD = 5.53$) to follow-

up, $p = .009$, but not from pre- to post-treatment, $p = .379$. Additionally, univariate tests

showed that there was a significant interaction between the intervention and time on one

subscale of the FFMQ, acting with awareness, $F(2) = 4.60$, $p = .011$, $\eta_p^2 = .030$, showing an

overall increase in FFMQ acting with awareness scores in the ACT intervention group but

not in the control group.

To examine the hypothesis that the mediator and outcome variables would be

significantly related, six separate correlations were conducted between each mediator and

outcome: between the AAQ and heavy-episodic drinking, AAQ and RAPI; the DTS and

heavy-episodic drinking, and DTS and RAPI; each subscale of the FFMQ and heavy episodic

drinking, each subscale of the FFMQ and RAPI. Pearson correlations were used for alcohol-

related problems, while Spearman correlations were used for heavy episodic drinking due to

the scale being ordinal. Correlations were examined using pre-treatment to follow-up change

scores for all variables. See Table 5 for correlations.

Discussion

The present study examined the effects of an ACT intervention on heavy episodic

drinking and related problems among a sample of college freshman who endorsed heavy

episodic drinking at baseline. In addition, psychological flexibility, distress tolerance (DT),

and mindfulness, specific targets of ACT (Hayes et al., 1996), were examined as potential

mechanisms of change. Contrary to hypotheses, significant differences were not found

between the ACT and the psychodidactic control condition on heavy episodic drinking or

alcohol-related problems although both decreased over time. Similarly, significant

differences between condition were not found on any of the mediator variables; however,

there were significant increases in psychological flexibility, DT, and most facets of

mindfulness across time. Additionally, higher psychological flexibility, DT, and

nonjudgment of inner experience facet of mindfulness were associated with fewer alcohol-

related problems.

Counter to the hypothesis, the ACT intervention did not outperform the

psychodidactic class in reducing heavy episodic drinking and alcohol-related problems. Of

note, preliminary analyses found that the ACT group endorsed higher levels of heavy

episodic drinking than the psychodidactic class at baseline assessment, which was controlled

for in outcome analyses. While there were not significant differences between the two conditions, both groups of college freshmen reported decreased heavy episodic drinking and related problems across time. The present results are somewhat consistent with previous literature, particularly in the absence of a no-treatment control condition. A meta-analysis by A-Tjak et al. (2015) found that, on a variety of mental and physical health measures, ACT outperformed no-treatment control conditions but was equally effective as active treatment comparisons. Further, Ickes, Haider, and Sharma (2015) conducted a systematic review of the literature on alcohol use prevention programs for college students, the majority of which were RCTs. They found that brief motivational interviewing, skills training, and self-assessment interventions all individually predicted decreases in alcohol use (e.g., quantity and episodes of binge drinking) and related problems. Lastly, Levin, Haeger, Pierce, and Twohig (2017) conducted an RCT of a web-based ACT intervention for college students and did not find between-groups differences between ACT and a waitlist control on alcohol use. Although the psychodidactic class was not an active treatment comparison, it included multiple assessments and other potentially active components (Dimeff, Baer, Kivlahan, & Marlatt, 1999; Ickes et al., 2015). Specifically, the ACT class focused on ACT principles, and the psychodidactic class addressed psychological concepts such as change, critical and practical thinking; personal wellness; building relationships; and managing finances. Previous literature suggests that psychoeducational interventions show similar effectiveness to active comparison interventions in reducing alcohol use in college students, and may even produce greater increases in awareness of alcohol-related consequences (Donohue, Allen, Maurer, Ozols, & DeStefano, 2004).

It is important to note that the reductions in self-reported alcohol use and related problems are contrary to previous literature suggesting that alcohol use generally increases across time among college freshmen (Borsari, Murphy, & Barnett, 2007). They further reported that about half the reports of drinking were episodes of heavy drinking. The present study showed small but significant decreases in heavy episodic drinking and alcohol-related problems across a year. This may suggest important implications in the prevention of alcohol use and related problems in college freshmen, especially considering the potential to disrupt the natural course of first year college student drinking. Previous research similarly suggests that brief motivational interventions (BMIs) such as Brief Alcohol Screening and Intervention for Colleges Students (BASICS), may have preventive effects on alcohol use and related consequences among college students (Dimeff et al., 1999; Kazemi, Sun, Nies, Dmochowski, & Walford, 2011). Of note, effect sizes for the decreases in heavy episodic drinking and alcohol-related problems in the present study were greater at follow-up than at post-treatment, suggesting potential lasting effects for preventive interventions. However, most studies include short-term follow-ups at three and/or six months (A-Tjak et al., 2015; Ickes et al., 2015; Lee et al., 2015) whereas the present study examined follow-up data at 12 months; therefore, further research is needed to determine the lasting effects of similar interventions.

Although significant differences between groups were not found on outcome measures, additional analyses examined relationships between the intervention and the mediators to test indirect effects of the intervention. Specifically, it was hypothesized that the ACT intervention would improve psychological flexibility, DT, and all facets of mindfulness. Again, significant differences were not found between groups on any of the mediator

variables. However, there were significant increases in psychological flexibility, DT, and all facets of mindfulness except observing over time across both conditions. While there is limited existing literature on mechanisms of change in ACT, previous research found that ACT increased mindful acceptance which, in turn, mediated treatment targets of symptoms of anxiety and depression, and overall distress (Levin et al., 2017). Additionally, Dubler (2019) examined an 8-week online ACT intervention and found increases in mindfulness and psychological flexibility as well as decreases in depressive symptoms. Of note, Dubler (2019) used a community clinical sample and did not include a control or comparison condition, whereas the present study examined incoming college freshmen and included an active control comparison.

Interestingly, in the present study there was a significant interaction between condition and time on the acting with awareness facet of mindfulness in which acting with awareness increased significantly from post-treatment to follow-up in the ACT condition but did not change between time points in the psychodidactic condition. This may suggest that learning ACT principles in particular could help college freshmen be aware of their behaviors. Previous literature suggests that, in general, higher general mindfulness is associated with decreased psychological concerns in college students (e.g., anxiety, depression, suicidality, PTSD, alcohol use; Bravo et al., 2017) and that the acting with awareness subscale of the FFMQ specifically is negatively associated with alcohol use (e.g., problematic use, frequency, and duration) and related problems in college students (Karyadi & Cyders, 2015; Roos, Pearson, & Brown, 2015).

When examining the relationship between mediators and outcomes, significant correlations were found between higher psychological flexibility, DT, and nonjudgment of

inner experience and fewer alcohol-related problems, which is consistent with previous literature (Ciarrochi et al., 2010; Renner, O'Dea, Sheehan, & Tebbutt, 2015). Renner et al. (2015) examined the association between days out of role (DOR; the inability to attend to commitments), binge drinking, and psychological flexibility among other variables in Australian college students. They found that DOR was significantly associated with increased binge drinking and lower psychological flexibility. Of note, psychological flexibility has also been associated with increased psychological wellbeing and symptom improvement across a variety of disorders such as anxiety and substance use (Ciarrochi et al., 2010).

Previous studies have also found associations among DT and mindfulness with alcohol-related problems. Simons, Sistad, Simons, and Hansen (2018) found that DT mediated the relationship between negative cognitive schemas and alcohol-related problems, which provides support for the increase in DT across groups in the present study given that both classes addressed cognitions, although using different methods. Additionally, higher mindfulness has been associated with fewer alcohol-related problems and mindfulness has also been shown to moderate the relationship between alcohol quantity and alcohol-related problems (Graber, 2017; Pearson, Brown, Bravo, & Witkiewitz, 2015). Roos et al. (2015) found that alcohol-related problems negatively related to three specific facets of mindfulness: describing, acting with awareness, and nonjudgment of inner experience, which differs slightly from the present findings. Specifically, present results only showed a negative association between alcohol-related problems and nonjudgment of inner experience. Of note, Roos et al. (2015) recruited college students from psychology classes in all class levels with a

mean age at the legal drinking age, while the present study focused on incoming college freshmen, most of whom were 18 years old.

Overall, results suggest that participating in a college course addressing issues of adjustment and psychological wellness or in a course focused on ACT principles predicted decreases in heavy episodic drinking and alcohol-related problems, which is consistent with previous findings that ACT and active treatment control conditions show comparable effectiveness in addressing alcohol use (A-Tjak et al., 2015; Ickes et al., 2015; Levin et al., 2017). Many factors common to both groups could have contributed to this decrease in heavy drinking and drinking-related consequences across groups such as repeated assessments (Dimeff et al., 1999; Ickes et al., 2015); the development of skills in each class (Donohue et al., 2004; Ickes et al., 2015); and/or the feedback (Butler, Silvestri, & Correia, 2014; Dimeff et al., 1999) provided by the instructor and peers in each class. Given that college students tend to increase their use of alcohol during their first year of college (Borsari et al., 2007), this finding may have useful clinical implications for college freshmen. Participating in either class also predicted increases in psychological flexibility, DT, and mindfulness over time; additionally, higher psychological flexibility, DT, and the nonjudgment of inner experience facet of mindfulness were related to fewer alcohol-related problems, suggesting potential indirect mechanisms. Given that these results are consistent with existing literature (Allan et al., 2015; Brown et al., 2013; Ciarrochi et al., 2010; Chiesa & Serretti, 2014), these transdiagnostic factors may be important prevention and intervention targets to reduce substance use and related problems as well as overall psychological wellbeing among college students.

Limitations. There were several limitations in this study, particularly in regards to the measurement of some variables. Heavy episodic drinking was measured by only one item from the Monitoring the Future (MTF; Institute for Social Research, University of Michigan) survey and was coded ordinally at unequal time points (e.g., "0" = 0 days; "1" = 1 day; "2" = 2 days; "3" = 3 to 5 days; "4" = 6 to 9 days; "5" = 10 to 19 days; "6" = 20 or more days). Further, this item, one of the two outcome variables, addressed heavy episodic drinking for the past 30 days while the other outcome variable, alcohol-related problems as measured by the RAPI, inquired about problems over the past ten weeks.

Additionally, the AAQ-II has been criticized for a lack of clarity, with some describing it as measuring psychological flexibility while others describe it as measuring experiential avoidance (e.g., the opposite of psychological flexibility; Rochefort, Baldwin, & Chmielewski, 2018), which could confuse interpretation of the scale. Rochefort et al. (2018) reported that while the AAQ-II displays adequate internal consistency, its convergent validity with the Multidimensional Experiential Avoidance Questionnaire (MEAQ) is suboptimal; theoretically, these two measures should highly correlate given they intend to measure the same construct. Further, and arguably more importantly, the AAQ-II was found to be more strongly correlated with measures of neuroticism and positive and negative affect than it was with the MEAQ or mindfulness (Rochefort et al., 2018), and some examinations via factor analysis have also raised concern about the construct validity the AAQ (Wolgast, 2014). Of note, the AAQ-II moderately correlated with several of the other measures used in this study, further questioning its construct validity. Given that it is unclear whether the AAQ-II more accurately measures psychological flexibility, neuroticism, or positive/negative affect, studies utilizing the AAQ-II should be mindful of this caveat.

When examining baseline correlations between scales, some subscales (e.g., observing and nonreactivity to inner experience) of the FFMQ did not significantly correlate with each other and in some cases, correlated more highly with the AAQ-II. This raises concerns about the construct validity of the FFMQ as well. Chiesa (2012) suggest that "the FFMQ could be relabeled as a questionnaire aimed at exploring five self-attributed psychological qualities rather than mindfulness" (p. 264).

One other potential concern with measurement was that most of the incoming freshmen completed baseline measures in the late summer or early fall, before they were on campus for a significant amount of time. In some cases, students completed baseline assessments less than two weeks after arriving on campus. Given the lack of time spent on campus, defining drinking endorsers at baseline may not have accurately captured episodes of heavy drinking for college freshmen in the college context.

Lastly, in addition to the lack of a no-intervention control group, another explanation for the lack of between-groups differences is that the ACT intervention was delivered in a college course format. ACT is typically delivered in an individual therapy setting, one-on-one with a mental health professional. Shorey et al. (2017) examined ACT as a group therapy in substance use treatment and, similar to our study, did not find differences between the ACT group and a TAU condition but did find that the ACT group outperformed TAU in reducing craving and increasing psychological flexibility, measured using the AAQ for Substance Abuse (AAQ—SA; Luoma, Drake, Hayes, & Kohlenberg, 2011). Additionally, other empirically supported mindfulness-based interventions, including MBCT (Segal et al., 2001), mindfulness-based stress reduction (MBSR; Kabat-Zinn, 2003), and MBRP (Bowen et al., 2011), typically include sessions lasting two to three hours per week for eight weeks as

well as homework assignments strictly focusing on practicing mindfulness. The current

course was a similar length, but only included mindfulness as one piece of the ACT hexaflex.

Given the lack of time that was able to be devoted to each topic, the impact of intervention

dosing should be examined in the future. Of note, although analyses only included

participants who attended at least five classes, analyses did not include a measure of class

information retention, practice and mastery.

Future directions. Given that this study was designed as a general ACT preventive

intervention and included assessment on a variety of different variables, future studies

examining ACT as a targeted intervention for substance use in college students could be

useful. It would also be helpful to address the measurement issues described above to strive

for more accurate measurement of alcohol use, related problems, and psychological

flexibility in college freshmen. Additionally, because the strength of the ACT intervention is

unknown (e.g., class format, lack of validity checks), future research should address the dose,

format, and delivery of the treatment.

Lastly, because general intervention appears to decrease heavy episodic drinking and

alcohol-related problems in college freshmen, and due to the lack of research on

mechanisms, future research should examine mechanisms of change between intervention

and substance use outcomes. Given that psychological flexibility, DT, and mindfulness have

been shown to be negatively associated with alcohol use and related problems, these

transdiagnostic factors may be useful prevention and intervention targets. Identifying

mechanisms of change will be useful in formulating transdiagnostic interventions, which may

be helpful in targeting a variety of disorders including comorbid presentations (Frank &

Davidson, 2014).

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Table 1

Participant Characteristics at Baseline

Variable	Total (*n* = 196)	ACT (*n* = 92)	Psychodidactic (*n* = 104)	p-value (t-test or Chi square)
Age, M (SD)	18.1 (.43)	18.1 (.42)	18.0 (.43)	.258
18 years old (%)	86.2	88.0	84.6	.403
Female (%)	53.1	51.1	54.8	.537
Race/Ethnicity (%; total may add to more than 100%)				
African American (4)	2.0	1.1	2.9	
Asian/Asian Amer. (2)	3.1	2.2	3.8	
Hispanic	10.7	13.0	8.7	
Native American/Alaska Native (1)	3.1	5.4	1.0	
Native Hawaiian or other Pacific Islander (3)	0.5	1.1	0.8	
Multiracial (6)	10.7	7.6	13.5	
White Non-Hispanic (5)	74.5	75.0	74.5	
Born in the U.S. (%)	92.9	93.5	92.3	.469
Current Disorder (%)	24.5	25.0	24.0	.876
Current Alcohol Use Disorder	8.2	7.6	8.7	.790

Table 2

Correlations Between Outcome and Proposed Mediator Variables at Baseline

	1	2	3	4	5	6	7	8	9
1: Heavy episodic drinking	--								
2: RAPI	.09	--							
3: AAQ	-.03	-.35**	--						
4: DTS	-.10	-.19**	.59**	--					
5: FFMQ observing	.06	-.01	.04	-.15*	--				
6: FFMQ describing	-.10	-.07	.42**	.30**	.31**	--			
7: FFMQ acting with awareness	-.17*	-.18*	.35**	.38**	-.15*	.35**	--		
8: FFMQ nonjudgment of inner experience	-.03	-.20**	.52**	.55**	-.30**	.26**	.45**	--	
9: FFMQ nonreactivity to inner experience	.05	-.06	.32**	.24**	.38**	.39**	.04	.01	--

**Correlation is significant at the .01 level.
*Correlation is significant at the .05 level.

Table 3

Descriptive Statistics

		Heavy episodic drinking		RAPI		AAQ-II		DTS	
		M	SD	M	SD	M	SD	M	SD
Baseline	ACT	2.33	1.15	4.36	5.24	52.81	10.38	3.73	0.73
	Psychodidactic	2.07	1.25	3.40	4.00	53.70	7.98	3.86	0.78
	Total	2.19	1.21	3.86	4.65	53.02	9.37	3.79	0.75
Post	ACT	1.95	1.47	4.01	5.10	52.12	9.57	3.90	0.77
	Psychodidactic	1.92	1.51	4.11	6.75	52.98	9.02	4.06	0.74
	Total	1.94	1.49	4.06	5.99	52.32	9.45	3.99	0.75
Follow-up	ACT	1.89	1.69	2.93	3.44	55.50	8.72	4.07	0.75
	Psychodidactic	1.67	1.48	2.94	3.52	54.79	8.92	4.01	0.75
	Total	1.78	1.58	2.94	3.47	54.95	8.83	4.04	0.75

Table 3

Descriptive Statistics (con't)

		FFMQ observing		FFMQ describing		FFMQ acting with awareness		FFMQ nonjudgment of inner experience		FFMQ nonreactivity to inner experience	
		M	SD	M	SD	M	SD	M	SD	M	SD
Baseline	ACT	24.58	5.68	28.73	6.40	28.74	4.91	29.35	6.94	21.53	4.95
	Psycho-didactic	24.86	6.36	28.19	6.33	27.67	5.87	30.52	6.13	22.35	5.15
	Total	24.84	6.03	28.32	6.36	28.13	5.49	29.88	6.64	22.14	4.96
Post	ACT	24.63	6.89	27.50	5.96	27.22	5.60	29.49	6.05	21.70	5.23
	Psycho-didactic	24.08	7.34	27.84	6.18	27.76	6.28	30.65	6.77	21.76	5.93
	Total	24.38	7.11	27.55	6.04	27.36	5.97	30.03	6.52	21.77	5.53
Follow-up	ACT	25.13	6.51	30.29	6.00	29.53	6.03	31.49	6.47	23.06	5.62
	Psycho-didactic	24.96	6.73	28.94	5.95	27.56	5.44	31.41	6.35	22.38	6.04
	Total	25.25	6.35	29.64	5.97	28.48	5.76	31.46	6.29	22.93	5.70

Table 4

Change Scores

		Heavy episodic drinking			RAPI			AAQ-II			DTS		
		M	SD	d	M	SD	d	M	SD	d	M	SD	d
Pre-Post	ACT	-0.37	1.29	.29	0.10	4.30	.07	-0.70	6.56	.07	0.18	0.71	.23
	Psychodidactic	-0.11	1.23	.11	0.71	5.96	.13	-1.01	7.47	.08	0.19	0.54	.26
Pre-Follow-up	ACT	-0.43	1.51	.30	-1.13	5.18	.32	2.60	9.82	.28	0.35	0.69	.46
	Psychodidactic	-0.34	1.55	.29	-0.46	3.15	.12	0.97	7.94	.13	0.13	0.70	.20
Post-Follow-up	ACT	-0.06	1.58	.04	-1.04	4.20	.25	3.30	10.01	.37	0.17	0.85	.22
	Psychodidactic	-0.23	1.59	.17	-1.17	6.43	.22	1.99	7.90	.20	-0.05	0.66	.07

		FFMQ observing			FFMQ describing			FFMQ acting with awareness			FFMQ nonjudgment of inner experience			FFMQ nonreactivity to inner experience		
		M	SD	d	M	SD	d	M	SD	d	M	SD	d	M	SD	d
Pre-Post	ACT	-0.03	5.72	.01	-1.30	5.40	.20	-1.58	4.97	.29	0.04	5.74	.02	0.12	5.46	.03
	Psychodidactic	-0.96	6.05	.11	-0.36	4.88	.06	0.07	4.91	.01	0.16	5.40	.02	-0.63	4.86	.11
Pre-Follow-up	ACT	0.63	5.23	.09	1.66	5.77	.25	0.79	5.12	.14	2.04	6.68	.32	1.54	4.99	.29
	Psychodidactic	0.05	5.90	.02	0.74	4.96	.12	-0.11	5.59	.02	0.98	5.50	.14	0.04	4.53	.01
Post-Follow-up	ACT	0.66	6.11	.07	2.96	5.84	.47	2.37	5.06	.40	2.00	6.52	.32	1.42	6.04	.25
	Psychodidactic	1.01	5.69	.12	1.09	5.07	.18	-0.19	5.06	.03	0.81	5.79	.12	0.67	4.99	.10

Table 5

Pre-Treatment to Follow-Up Change Score Correlations Between Mediators and Outcomes.

	Heavy episodic drinking (Spearman's rho)	RAPI (Pearson's r)
AAQ	-.13	-.29**
DTS	-.15	-.22**
FFMQ observing	-.07	.09
FFMQ describing	-.10	-.03
FFMQ acting with awareness	-.01	-.06
FFMQ nonjudgment of inner experience	-.02	-.23**
FFMQ nonreactivity to inner experience	-.06	-.01

**Correlation is significant at the .01 level.
*Correlation is significant at the .05 level.

Appendix A

Demographics Questionnaire

Age
1. Age
  ☐ 17
  ☐ 18
  ☐ 19
  ☐ 20
  ☐ I choose not to answer

Nationality
3. Were you born in the United States?
  1☐ Yes
  2☐ No   11a. If no, in what country were you born?
  99 I chose not to answer 11b. If no, at what age did you move to the U.S.?

Race/ethinicity
4. What is your ethnic background? (Choose one of the following)
  1☐ Hispanic or Latino
  2☐ Not Hispanic or Latino
  99☐ I choose not to answer
5. What is your racial background? (Choose one of the following)
  1☐ American Indian/Alaska Native
  2☐ Asian
  3☐ Native Hawaiian or other Pacific Islander
  4☐ Black or African American
  5☐ White or Caucasian
  6☐ Multiracial
  I choose not to answer 99
If multiracial, check all that apply
  ☐ American Indian/Alaska Native
  ☐ Asian
  ☐ Native Hawaiian or other Pacific Islander
  ☐ Black or African American
  ☐ White or Caucasian
  ☐ I choose not to answer

Gender
6. What gender are you?
  1☐ Man
  2☐ Woman
  3☐ Transgender
  4☐ Other (please describe):_____
  99 I choose not to answer

Appendix B

Acceptance and Action Questionnaire – II (AAQ – II)

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1. Its OK if I remember something unpleasant. 1 2 3   4 5 6 7

2. My painful experiences and memories make it difficult for me to live a life that I would value. 1 2 3   4 5 6 7

3. I'm afraid of my feelings. 1 2 3   4 5 6 7

4. I worry about not being able to control my worries and feelings. 1 2 3   4 5 6 7

5. My painful memories prevent me from having a fulfilling life. 1 2 3   4 5 6 7

6. I am in control of my life. 1 2 3   4 5 6 7

7. Emotions cause problems in my life. 1 2 3   4 5 6 7

8. It seems like most people are handling their lives better than I am. 1 2 3   4 5 6 7

9. Worries get in the way of my success. 1 2 3   4 5 6 7

10. My thoughts and feelings do not get in the way of how I want to live my life. 1 2 3   4 5 6 7

Appendix C

Distress Tolerance Scale (DTS)

Think of times that you feel distressed or upset. Select the response that best describes your beliefs about feeling distressed or upset.

1	2	3	4	5
Strongly disagree	Mildly disagree	Agree and disagree	Mildly agree	Strongly agree

1. Feeling distressed or upset is unbearable to me.
2. When I feel distressed or upset, all I can think about is how bad I feel.
3. I can't handle feeling distressed or upset.
4. My feelings of distress are so intense that they completely take over.
5. There's nothing worse than feeling distressed or upset
6. I can tolerate being distressed or upset as well as most people.
7. My feelings of distress or being upset are not acceptable
8. I'll do anything to avoid feeling distressed or upset.
9. Other people seem to be able to tolerate feeling distressed or upset better than I can.
10. Being distressed or upset is always a major ordeal for me.
11. I am ashamed of myself when I feel distressed or upset.
12. My feelings of distress or being upset scare me.
13. I'll do anything to stop feeling distressed or upset.
14. When I feel distressed or upset, I must do something about it immediately.
15. When I feel distressed or upset, I cannot help but concentrate on how bad the distress actually feels.

Appendix D

Five Facets of Mindfulness Questionnaire (FFMQ)

Please rate each of the following statements using the scale provided. Click in the box that best describes <u>your own opinion</u> of what is <u>generally true for you.</u>

1	2	3	4	5
never or very rarely	rarely	sometimes	often	very often or always

1. When I'm walking, I deliberately notice the sensations of my body moving.
2. I'm good at finding words to describe my feelings.
3. I criticize myself for having irrational or inappropriate emotions.
4. I perceive my feelings and emotions without having to react to them.
5. When I do things, my mind wanders off and I'm easily distracted.
6. When I take a shower or bath, I stay alert to the sensations of water on my body.
7. I can easily put my beliefs, opinions, and expectations into words.
8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
9. I watch my feelings without getting lost in them.
10. I tell myself I shouldn't be feeling the way I'm feeling.
11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
12. It's hard for me to find the words to describe what I'm thinking.
13. I am easily distracted.
14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
15. I pay attention to sensations, such as the wind in my hair or sun on my face.
16. I have trouble thinking of the right words to express how I feel about things
17. I make judgments about whether my thoughts are good or bad.
18. I find it difficult to stay focused on what's happening in the present.
19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
21. In difficult situations, I can pause without immediately reacting.
22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
23. It seems I am "running on automatic" without much awareness of what I'm doing.
24. When I have distressing thoughts or images, I feel calm soon after.
25. I tell myself that I shouldn't be thinking the way I'm thinking.
26. I notice the smells and aromas of things.
27. Even when I'm feeling terribly upset, I can find a way to put it into words.
28. I rush through activities without being really attentive to them.
29. When I have distressing thoughts or images I am able just to notice them without reacting.
30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
32. My natural tendency is to put my experiences into words.
33. When I have distressing thoughts or images, I just notice them and let them go.
34. I do jobs or tasks automatically without being aware of what I'm doing.
35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
36. I pay attention to how my emotions affect my thoughts and behavior.
37. I can usually describe how I feel at the moment in considerable detail.
38. I find myself doing things without paying attention.
39. I disapprove of myself when I have irrational ideas.

Appendix E

Monitoring the Future Survey (MTF; 1 item)

<u>During the past 30 days</u>, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?
    0. 0 days
    1. 1 day
    2. 2 days
    3. 3 to 5 days
    4. 6 to 9 days
    5. 10 to 19 days
    6. 20 or more days
    99. I choose not to respond

Appendix F

Rutgers Alcohol Problem Inventory (RAPI)

Different things happen to people while they are drinking ALCOHOL or because of their ALCOHOL drinking. Several of these things are listed below. Indicate how many times each of these things happened to you WITHIN THE LAST 10 WEEKS.

HOW MANY TIMES HAS THIS HAPPENED TO YOU WHILE YOU WERE DRINKING OR BECAUSE OF YOUR DRINKING *DURING THE LAST 10 WEEKS?*

Use the following code:
0= None
1 = l-2 times
2 = 3-5 times
3 = More than 5 times
99= I choose not to respond

1. Not able to do your homework or study for a test
2. Got into fights with other people (friends, relatives, strangers)
3. Missed out on other things because you spent too much money on alcohol
4. Went to work or school high or drunk
5. Caused shame or embarrassment to someone
6. Neglected your responsibilities
7. Relatives avoided you
8. Felt that you needed more alcohol than you used to use in order to get the same effect
9. Tried to control your drinking (tried to drink only at certain times of the day or in certain places, that is, tried to change your pattern of drinking)
10. Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking
11. Noticed a change in your personality
12. Felt that you had a problem with alcohol
13. Missed a day (or part of a day) of school or work
14. Wanted to stop drinking but couldn't
15. Suddenly found yourself in a place that you could not remember getting to
16. Passed out or fainted suddenly
17. Had a fight, argument or bad feelings with a friend
18. Had a fight, argument or bad feelings with a family member
19. Kept drinking when you promised yourself not to
20. Felt you were going crazy
21. Had a bad time
22. Felt physically or psychologically dependent on alcohol
23. Was told by a friend, neighbor or relative to stop or cut down drinking

Vita

Jamie Kirkpatrick was born in Orlando, FL, to Edward and Sooki Kirkpatrick. She attended Appalachian State University from August 2012 to May 2016 and earned her Bachelor of Science degree in psychology with a concentration in human services. In the fall of 2016, she continued her studies at Appalachian State University in pursuit of a Master of Arts in Clinical Psychology and was awarded this degree in May 2019.

Jamie Kirkpatrick will be pursuing her Ph.D. in Clinical-Community Psychology at the University of Alaska Anchorage beginning in the fall of 2019, where she will reside with her mother and her son.