Craving in substance and behavioral addiction: the role of emotion regulation

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Craving in substance and behavioral addiction:

The role of emotion regulation

by

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A Thesis
Submitted to the University at Albany, State University of New York
in Partial Fulfillment of
the Requirements for the Degree of
Master of Arts

College of Arts & Sciences
Department of Psychology
2016
Abstract

Individuals with emotion regulation difficulties lack the strategies to monitor and evaluate the emotional experience, often leading to an increase in efforts to constrict or conceal the emotional expression. Deficits in emotion regulation are associated with an increase in craving for risky behaviors, such as alcohol and internet use. Non-acceptance and impulse control are two domains of emotion regulation that have been linked to behavioral and substance cravings. What remains to be elucidated is whether these relationships are mediated by strategies employed to control the emotional experience. The current study aims to identify whether thought suppression mediates the relationship between two aspects of emotion regulation and alcohol craving and whether this model applies to craving for online social networking. An undergraduate sample of 629 participants was included. The study used the Difficulties in Emotion Regulation Scale, the White Bear Suppression Inventory, the Penn Alcohol Craving Scale, and a modified version of the Penn Alcohol Craving Scale for Facebook. Emotion regulation difficulties and craving for alcohol and Facebook was mediated by thought suppression. The results of this study support previous findings showing that thought suppression has some effect on craving. These results provide evidence for the use of different interventions, such as mindfulness and acceptance, in the treatment of both substance and behavioral addictions.
**Introduction**

The ability to successfully regulate one’s emotions is associated with positive outcomes in various life domains, including health, relationships, work, and academic performance (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Deficits in emotion regulation, on the other hand, have been found to account for at least some of the variance in the development of psychopathologies (Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003; Kring, & Bachorowski, 1999; Mennin & Farach, 2007). For example, it has been postulated that the inability to manage one’s emotional responses to everyday external events leads to chronic stress and pathologies (Campbell-Sills & Barlow, 2007) including depression and anxiety (Mennin, Holaway, Fresco, Moore, & Heimberg, 2007), bipolar disorder, borderline personality disorder, eating disorders, and alcohol and substance-related disorders (Aldao et al., 2010). The study of emotion regulation deficits as a function of pathology and associated maladaptive behaviors has become a primary focus in research (Gross & Munoz, 1995), often overshadowing symptom-focused research (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Furthermore, the now increasingly recognized relationship between emotion regulation deficits and psychopathologies has led to the incorporation of emotion regulation training in many therapeutic interventions including dialectic behavioral therapy, mindfulness interventions, and emotion focused therapy (Aldao et al., 2010).

**Background**

**Emotion Regulation Processes**

Emotion regulation processes differ from emotion generating processes (Gross & Thompson, 2007; Rottenberg & Gross, 2003). The distinction, though still a source of some debate (Campos, Frankel, & Camras, 2004), establishes regulation processes as strategies utilized to change either the magnitude or type of response to an emotional event (Gross, 1998). There are differing
opinions in how to best conceptualize emotion regulation processes. One conceptualization proposes that emotion regulation is the need to control and change negative emotional experiences. According to this view the goal of emotion regulation is to reduce emotional arousal by reducing the negative affect (Cortez & Bugental, 1994; Kopp, 1989). Others have rejected the notion that the goal of emotion regulation strategies is simply to reduce negative affect, postulating that emotion regulation is not the same as emotional control (Gratz & Roemer, 2004; Gross & Munoz, 1995). This alternative view suggests that emotion regulation strategies not only involve modifying the internal state, but perhaps more importantly, require an individual to be able to monitor and evaluate the emotional experience (Thompson & Calkins, 1996).

Until recently research in emotion regulation was equivocal due to a lack of agreement on how to conceptualize emotion regulation and appropriate outcome measures (Gratz & Roemer, 2004). The Difficulties in Emotion Regulation Scale (DERS), one of the most widely used and well-validated assessments of emotion regulatory deficits, identifies six emotion regulation strategies that are conceptually and empirically supported (Gratz & Roemer, 2004). The six strategies outlined by Gratz and Roemer (2004) are theoretically similar to the view that emotion regulation is not about control, but rather about evaluating and monitoring one’s emotional experience (Cole, Michel, & Teti, 1994; Hayes, Strosahl, & Wilson, 1999; Thompson & Calkins, 1996). According to Gratz and Roemer (2004), the ability to appropriately evaluate and monitor emotional experiences involves (1) awareness, (2) clarity and (3) acceptance of the emotional state, followed by the ability to (4) control impulses in order to change the experience. Finally, appropriate regulation should enable the individual to (5) act in line with their goals despite their emotional state and (6) use adaptive strategies to modulate the emotional experience.
**Acceptance.** Theorist postulate that efforts to constrict or conceal one’s emotional expression to avoid negative emotional experiences often result in a seemingly paradoxical increase in psychopathology (Gross & Levenson, 1997; Hayes et al., 1996; Notarius & Levenson, 1979). These findings provide support for the argument that emotion regulation differs from emotion control such that the attempt to control one’s internal state can interfere with adaptive regulation processes, such as acceptance of emotional responses (Cole et al., 1994; Gratz & Roemer, 2004). A lack of acceptance can lead to an increase in negative emotions in response to one’s emotional reactions (Cole et al., 1994; Hayes et al., 1999), such that the individual focuses on controlling his or her internal state rather than acknowledging, evaluating, and monitoring the emotional experience (Cole et al., 1994; Hayes et al., 1999; Thompson & Calkins, 1996).

**Impulsivity.** An individual’s emotions and cognitions are the product of external events, internal sensations, and past experiences (Barrett, 2009). Therefore, the variability in people’s emotional experience is directly related to the variability in and interpretation of their past external and internal experiences. Impulsive individuals, it is hypothesized, may rely more heavily on their past experiences when making decisions, rather than their current external or internal state. The inability to see and interpret the whole gestalt of experiences can lead to increased impulsivity (Barrett, 2009). Impulsivity is considered an emotion regulation deficit, such that the action is often enacted to control, change, or eliminate the emotional experience (Thompson & Calkins, 1996). More adaptive strategies include modulating the arousal associated with the entire experience (i.e., seeing and interpreting the whole gestalt) and focusing on long-term goals (Baumeister, Muraven, & Tice, 2000). These strategies have been shown to
decrease the urgency to act on the emotion and increase the ability to control behavior in response to the emotion (i.e., deceeding impulsivity) (Barrett, 2009; Thompson & Calkins, 1996).

**Thought suppression.** Beyond Gratz and Roemer’s (2004) conceptualization of emotion regulation alternative cognitive strategies have been cited as additional domains of emotion regulation. Among them is thought suppression, commonly defined as a voluntary process employed when an individual chooses not to think about something, or a self-regulatory strategy employed to stop unwanted thoughts related to undesirable behaviors (Moss, Erskine, Albery, Allen, & Georgiou, 2015; Wenzlaff & Wegner, 2000). Unlike acceptance, thought suppression is generally thought of as an ineffective emotion regulation strategy (Aldao et al., 2010), with findings showing that individuals who engage in thought suppression attempt to control their thoughts in order to avoid accepting them (Marcks & Woods, 2005). Therefore, thought suppression is thought to be the mechanism by which non-acceptance is enacted in individuals who are trying to avoid their internal state. Similarly, it is hypothesized that individuals who are struggling with impulse control attempt to control their thoughts surrounding the undesirable behavior by engaging in the process of thought suppression.

Indeed, research explicitly show that attempts to suppress unwanted thoughts leads to a seemingly paradoxical increase in preoccupation with the thoughts (Wegner & Erber, 1992; Wegner, Schneider, Carter, & White, 1987). Wegner and Erber (1992) argue the reason for this sequence of events is due to two mental processes being initiated simultaneously. The first is a conscious and effortful process in which the individual is actively searching for distractors to avoid the unwanted thought. While the conscious process is taking place, a simultaneous unconscious process is seeking out the unwanted thought. Therefore, the increase in the salience of the unwanted thought occurs because the conscious process seeking to avoid the thought
subsequently initiates the unconscious process, which increases the cognitive accessibility of the unwanted thought (Wegner & Erber, 1992; Wegner & Zanakos, 1994).

**Thought suppression and craving.** Wegner & Erber (1992) demonstrated that continuous suppression of thoughts can make them hyper-accessible. The hyper-accessibility of unwanted thoughts leads to both an increase in the salience of stimuli related to the unwanted thought and an increase in behaviors associated with the thoughts (Erksine & Georgiou, 2011). An increase in the salience of thoughts associated with a desired, but avoided behavior has been shown to lead to an increase in cravings or strong urges to enact the behavior (Sayers & Sayette, 2013; Spada, Caselli, & Wells, 2013). This has been demonstrated in smoking (Sayers & Sayette, 2013) as well as in the first phase of a treatment for problematic drinking (Spada et al., 2013).

Craving has been implicated in many addictive behaviors, to the extent that it was added as a criterion for substance-use disorder in the most recent edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association (APA), 2013). One of the earliest views of craving suggested that it is a direct consequence of the risky behavior (drinking, drug use, gambling, etc.), which in turn elicits an increase in the behavior (Ludwig & Winkler, 1974; Ludwig, Winkler, & Stark, 1974). As this cycle continues there is a loss of control over the behavior. More recently, the predominant view of craving has changed from its conceptualization as a physiological phenomenon to a largely psychological one. More recent theoretical frameworks of craving etiology suggest that the onset of craving comes from a desire to alleviate psychological distress, thus leading to a psychological need for enactment of the behavior (e.g. consumption of tobacco, alcohol, or other drugs of abuse) (Tiffany, 1990).
Therefore, internal stimuli such as stress, depression, or anxiety can elicit a craving, which then leads to engagement in the behavior.

Research has shown that craving can result from the inability to appropriately regulate one’s emotions (Evenden, 1999; Fox, Berquist, Hong & Sinha, 2007; Fox, Hong, Sinha, 2008). Findings have demonstrated a connection between sensitivity to stress and craving for alcohol during early abstinence (Fox et al., 2007). Fox and colleagues (2008) found that abstinent alcoholics with emotion regulation deficits, including impulse control difficulties, had higher vulnerability to relapse. Concordantly, these findings were demonstrated in a sample of recently abstinent cocaine users (Fox, Axelrod, Paliwal, Sleeper, & Sinha, 2007). Despite the literature supporting an association between emotion regulation deficits and craving, the role of thought suppression as a mediating factor in this relationship remains unclear. One possible model that can explain the role of thought suppression in the relationship between emotion regulation deficits, such as non-acceptance and impulsivity, and craving for a risky behavior is the ego depletion model (Baumeister et al., 2000). The ego depletion model theorizes that self-regulation is a limited resource and the engagement in risky behaviors that require some degree of self-regulation will ultimately deplete the source resulting in an inability to abstain from engagement in behaviors (Baumeister et al., 2000). This model applies to all individuals, regardless of their capacity to regulate emotions, but presumably depletion of resources is accelerated in those engaged in maladaptive emotion regulation strategies. For example, non-acceptance of one’s emotional state depletes self-regulation resources. If the resources are depleted enough there is the likelihood that the individual will experience an increase in emotional intensity. Additionally, low self-regulation resources can ultimately lead to an inability to restrain one’s impulses. Together, these depletions can lead to an increase in
susceptibility of thoughts related to the desired behavior (Baumeister et al., 2000), hyper-accessibility of salient stimuli (Wegner & Erber, 1992), and craving for the risky behavior (Erksine & Georgiou, 2011). It is hypothesized that the connection between thoughts and the increase in craving is due, at least in part, to attempts to suppress the thoughts. That is, deficits in emotion regulation deplete self-regulatory strategies and individuals may be more prone to use thought suppression in an attempt to manage their internal state. The act of suppressing thoughts ultimately leads to an increase in the salient stimuli, thoughts, and craving for the behavior.

**Emotion Regulation and Alcohol**

The relationship between emotion regulation strategies and psychopathology varies depending on the strategy and pathology (Aldao et al., 2010). A number of risky behaviors correlate with deficits in emotion regulation (Weiss, Tull, Viana, Anestis, & Gratz, 2012), including high-risk sexual behaviors (Messman-Moore, Walsh, & DiLillo, 2010; Tull, Weiss, Adams, & Gratz, 2012) and substance use (Bonn-Miller, Vujanovic, & Zvolensky, 2008; Vilhena-Churchill & Goldstein, 2014). Excessive alcohol use, it is hypothesized, may serve to down-regulate negative emotions in the absence of more adaptive emotion regulation strategies (Aldao et al., 2010; Sher & Grekin, 2007; Tice, Bratslavsk, & Baumeister, 2001). While both positive and negative emotions can serve as motivation for the consumption of alcohol (Dragan, 2015), it is the consumption as a way to modulate negative emotion that makes it a maladaptive regulatory strategy (Dragan, 2015). Emotion regulation deficits have consistently been shown to predict problematic alcohol use, with greater deficits reported in alcohol dependent individuals as compared to non-clinical samples (Berking et al., 2011). The inability to cope with the aversive emotional state in conjunction with an increase in negative affect has been shown to increase the desire to drink, as well as subsequent levels of alcohol consumption (Gamble et al.,
2010; Hodgins, el-Guebaly, & Armstrong, 1995; Swendsen et al., 2000). Additionally, failure to cope with the internal affective state can lead to an increase in impulsivity, which has been associated with relapse in alcoholics (Evenden, 1999), and presumably an increase in craving (Fox et al., 2007).

Findings to date generally support a relationship between non-acceptance, impulsivity, thought suppression, and alcohol craving. The notion of “obsessive craving” theorizes that craving for the alcohol is linked to both deficits in emotion regulation and a lack of control over intrusive thoughts (Verheul, van den Brink, Geerlings, 1999). Research on obsessive craving affirms that the craving for the avoided behavior (drinking) is proportional to the amount of time occupied by the alcohol-related thoughts (thought suppression), the amount of resistance against having the alcohol-related thoughts (non-acceptance), and the degree of control over the alcohol related thoughts (Modell, Glaser, Mountz, Schmaltz, & Cyr, 1992). Consistent with the tenets of the ego-depletion model, it can be hypothesized that the inability to modulate the internal affective experience leads to depletion in self-regulatory strategies, leading to ineffective attempts to reduce unwanted thoughts, causing an increase in the frequency and salience of these thoughts, and an increase in craving.

**Study aim 1.** Acceptance and impulse control refer to the abilities to accept one’s emotional state and either move towards or away from a desired behavior in order to modulate the internal experience (Gratz & Roemer, 2004). Thought suppression on the other hand is the process employed to avoid the emotional state (Wegner & Eber, 1992; Wegner & Zanakos, 1994). That is, an individual can be non-accepting of their emotional state and not engage in thought suppression, but it is unlikely that individuals who engage in thought suppression are accepting of their emotions. The primary aim of the current study was to examine the role of
thought suppression as a mediator in the relationship between emotion regulation deficits (non-acceptance and impulsivity) and cravings for alcohol.

**Behavioral Addictions**

**Substance versus behavioral addictions.** Beyond substance and alcohol use recent addiction research has increasingly focused on behavioral addictions (Potenza, 2006, Potenza, 2009), particularly when it comes to regulatory strategies and craving (Byun et al., 2009; Chou, Condron, & Belland, 2005). The addictive potential of behaviors has been most extensively studied in pathological gambling, with research showing that like alcohol abuse, excessive gambling is used as a palliative strategy to escape from or down-regulate emotions (Williams, Grishman, Erksine, & Cassedy, 2012). Gambling has been shown to be associated with a deficit in self-control, and to be further exacerbated by deficits in regulating emotions. Particularly, individuals with gambling disorder rely on avoidance (non-acceptance) and escape as affective coping strategies (Williams et al., 2012). Interestingly, findings with regard to the role of emotion regulation deficits and problem gambling have been somewhat inconsistent, with some research showing significant relationships between certain domains of emotion regulation and other studies reporting non-significant relationships, for example between thought suppression and gambling (Williams et al., 2012).

Prior to the recent edition of the DSM-5 (APA, 2013), gambling disorder, which was previously called pathological gambling, was classified as an impulse control disorder. Important similarities between gambling disorder and substance-use disorder provided the impetus for the reclassification of “Pathological Gambling” as “Gambling Disorder” and its inclusion in the substance-use disorder section of the DSM-5. Substance-use and gambling use disorder are highly comorbid (Petry, 2010; Petry, Stinson, & Grant, 2005), share many similar characteristics
including genetic and physiological consistencies (Blanco, Myers, & Kendler, 2012; Potenza et al., 2014; Slutske et al., 2000), and have a similar presentation of symptoms (Petry, 2006). Criteria for the diagnosis of gambling disorder include the presence of withdrawal symptoms and craving for the behavior (APA, 2013), which further illuminates the similarities between the two disorders. Given these substantial parallels, it seems appropriate to hypothesize a role of emotion regulation deficits in the emergence of craving in behavioral addictions.

**Internet addiction.** The research on similarities between substance and behavioral addictions has extended to include other potentially problematic behaviors, including internet addiction. It has been hypothesized, based on established commonalities between substance use and gambling disorder, that internet addiction may share many of the same features as substance dependence (Aboujaoude, 2010; Young, 1998; 2004), including excessive use, tolerance, and withdrawal symptoms (Block, 2008). Proposed criteria for the inclusion of internet addiction in diagnostic manuals have included: time spent longer than initially intended and planned, time distortion, compulsive behaviors, failure to stop or control use, deception about extent of use, utilization of the internet activity to cope with or escape problems, and preoccupation with internet use when offline (Atmaca, 2007; Shapira et al., 2003; Young, 1996). While some have argued that internet and substance addiction are different because the former relies on the behavior as the reward while the latter relies on a toxin (Shaffer, 1996; Whang, Lee, & Chang, 2003), the parallels between gambling disorder and substance use, as well as the proposed criteria, imply that internet addiction is likely similar to that of substance-use disorder, particularly in regards to the role of emotion regulation and craving.

Different hypothesized mechanisms, including mood management and craving have been highlighted as factors contributing to the onset and maintenance of internet addiction. Working
from the disease model of behavioral addiction (Van Rooij & Prause, 2014), it has been posited that engagement in internet activity is implemented to reduce or distract from negative affect and to increase elation (Mastro Eastin, & Tamborini, 2002). While the internet can be helpful for increasing social support (Wellman, Haase, Witte, & Hampton, 2001), the concern is when it becomes one of the primary coping methods to reduce aversive states (Van Rooij & Prause, 2014). These assertions are supported by findings showing that 8.3% of adults report using the internet to reduce negative mood and/or escape life’s problems (Aboujaoude, Koran, Gamel, Large, & Serpe, 2006). These findings provide additional evidence for the working hypothesis that internet addiction, like other behavioral addictions and substance-use disorders, is driven by a lack of adaptive emotion regulatory skills. Similar to early research on gambling it is possible to draw parallels between substance and alcohol-use disorders, gambling disorder, and internet addiction.

Based on the model outlined for alcohol, which concludes that thought suppression may play a role in the relationship between emotion regulation deficits and craving for a maladaptive behavior (i.e., drinking), it is posited that internet addiction may be related to emotion regulation in the same way. Research concludes that like previously established behavioral addictions (gambling disorder (Williams et al., 2012)) internet addiction is associated with deficits in emotion regulation (Hormes, Kearns, & Timko, 2014). What remains to be elucidated is the role of craving in internet addiction. Based on the proposed criteria it is suggested that craving does exist, but its role in relation to acceptance, impulse control, and thought suppression is unclear. Like alcohol craving (Tiffany, 1990), it is hypothesized that internet use is associated with a reduction in a negative mood, thus leading to an onset of thoughts related to consuming the desired behavior.
**Online social networking.** Internet addiction is the most common term used to describe behavioral addiction to online activities, though conceptually it is broad. It has been argued that it is not the internet per se that is addictive, but rather the activity carried out on the internet that is potentially addictive. Five domains have been cited as forms of internet addiction, 1) computer addiction, 2) information overload, 3) net compulsions, 4) cyber sexual addiction, and 5) cyber-relationship addiction (Young, 1998). Net compulsions, according to Young (1998), encompass online gambling, while cyber-relationships refer to addictions to online relationships. The latter includes what is commonly referred to as Social Networking Sites (SNS) or Online Social Networking (OSN). OSN relies on websites such as Facebook, Instagram, and Twitter, which due to their variable interval schedule of reinforcement for ‘likes’ and ‘comments,’ and conditioned cues, such as notifications, can lead to excessive and maladaptive use (Kuss & Griffiths, 2011; Wise, Alhabash, Park, 2010). A prior study examined craving in Facebook and found that individuals reported high levels of craving for the social networking site, especially when compared to craving in alcohol-dependent individuals (Hormes et al., 2014).

**Study aim 2.** A secondary aim of the present study was to apply the hypothesized mediation model outlined for alcohol craving to online social networking, postulating that the relationship between non-acceptance and impulsivity and craving for OSN use is mediated by thought suppression. This aim is supported by literature highlighting the similarities between substance use disorders and behavioral addictions (Williams et al., 2012), the inclusion of craving as a potential criterion for internet addiction (Aboujaoude, 2010; Young, 1998; Young, 2004), and recent findings suggesting a relationship between emotion regulation deficits and disordered online social networking use (Hormes et al., 2014). In line with previous research
(Hormes et al., 2014) and its prevalence¹, the current study will use the website Facebook as the OSN of study.

### Methods

**Procedure and Participants**

The current study was a secondary analysis of data from a cross-sectional study of alcohol and Facebook usage in college students. Participants were undergraduate students recruited from a large Northeastern university. All participants received course credit in exchange for their completion of the study. Inclusion criteria included being 18 years of age or older and fluency in English. The surveys were accessible through the online service Survey Monkey, which employs a Secure Sockets Layer encryption. The overseeing university review board approved the initial study. All respondents were informed of the nature and purpose of the study and consented prior to their participation.

A total of 654 individuals logged on to the study. Of the 654 who opened the study, 25 individuals failed to provide their age or reported being under the age of 18. Those individuals were excluded from the data analysis. The remaining sample, which was used for further analysis, included 629 participants.

**Instruments**

The current analysis focused on data from four measures that were part of the original battery of questionnaires. The larger online survey consisted of twenty-four questionnaires and demographic information. For the purposes of the current analysis, only demographics, selected acculturation items, and ratings on the Difficulties in Emotion Regulation Scale (DERS; Gratz &

¹ According to data provided by Facebook (http://newsroom.fb.com/company-info/ accessed 11 August 2015), Facebook is among the most popular OSN with more than 950 million users reported daily.
Roemer, 2004), White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994), Penn Alcohol Craving Scale (PACS; Flannery, Volpicelli, & Pettinati; 1999), and the Penn Alcohol Craving Scale modified for Facebook craving (PACS-FB; Hormes et al., 2014) were examined.

**Demographics.** All participants were asked to complete a series of demographic questions. Demographic information included age, sex, and race/ethnicity. In addition, in-depth information was collected regarding acculturation. Items included country of origin, time spent in the United States, and native language/language preferences. The current analyses utilized selected acculturation questions in order to identify potential differences between United States (U.S.) and non-U.S. born students.

**Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004).** The Difficulties in Emotion Regulation Scale (DERS) was developed based on an integrative model of emotion regulation and is regarded as more comprehensive than other existing measures. The measure addresses the modulation of emotional awareness, arousal, understanding, acceptance, and willingness to act in line with one’s goals despite their emotional state (Gratz & Roemer, 2004). In addition, the measure aims to assess the ability to use appropriate regulation strategies to modulate emotional responses. The measure includes 36 self-report items scored on a 1 to 5 Likert scale, with 1 representing 0-10% of the time, 3 representing 36-65% of the time, and 5 representing 91-100% of the time. The measure includes a total score along with six subscales, 1) non-acceptance of emotions, 2) lack of emotional awareness, 3) lack of emotional clarity, 4) impulse control difficulties, 5) difficulties engaging in goal directed behavior when emotionally aroused, and 6) limited access to emotion regulation strategies. Overall internal consistency was excellent, with reliability coefficient $\alpha = .93$. Good test-retest reliability has been previously reported (Gratz & Roemer, 2004). The current analyses utilized two of the six subscales of the
DERS, acceptance and impulsivity. Rationale for use of these two subscales is two-fold. Conceptually, only awareness, clarity, non-acceptance, and impulsivity were considered, as the remaining two subscales refer to the strategies and goals enacted to deal with the aversive state (Gratz & Roemer, 2004). Among the four remaining subscales, recent findings showed that only non-acceptance and impulsivity were related to Facebook craving (Hormes et al., 2014), thus these two subscales were included in the analyses.

**White Bear Suppression Inventory (WBSI, Wegner & Zanakos, 2004).** The White Bear Suppression Inventory (WBSI) was originally developed based on findings showing a correlation between thought suppression, obsessive thinking, and subsequent emotional reactivity (Wegner & Erber, 1992). The aim was to develop a measure that was predictive of chronic thought suppression. The WBSI is composed of 15 self-report items scored on a five point Likert scale. Responses range from 1 (strongly disagree) to 5 (strongly agree). Scoring of the WBSI results in a single total score obtained by summing the 15 items. Scores can range from 15 to 75. Higher scores on the WBSI indicate a greater tendency to suppress thoughts. The measure demonstrated excellent internal consistency in the current sample (α = .95).

**Penn Alcohol Craving Scale (PACS; Flannery, Volpicelli, & Pettinati; 1999).** The Penn Alcohol Craving Scale (PACS) was developed to assess craving in alcoholics. The PACS was created based on research showing that craving is an important element of dependence and often precedes the drinking (Kozlowksi, Mann, Wilkinson, & Poulos, 1989). According to the authors, prior to the development of the PACS, there was no empirical data showing that craving predicts subsequent drinking (Flannery et al., 1999). The PACS is a multi-item, single-factor scale. The scale contains 5 questions, each scored on a Likert scale ranging from 0 to 6. The anchors of the scale differ based on the content of the question. The first three questions address
the frequency, intensity, and duration of the thoughts. The fourth question measures the ability of
the participant to abstain from drinking, and the final question asks the participant to rate their
overall average craving over the previous week. The total score is calculated by summing the
five items. This measure was found to have good internal consistency in the current sample ($\alpha = .90$).

**Penn Alcohol Craving Scale - Facebook (PACS-FB; Hormes et al., 2014).** The current
study used a validated modified version of the PACS to measure craving for Facebook (Hormes
et al., 2014). The five items included were similar in nature to the original PACS, with the first
three questions addressing frequency, intensity, and duration of the thoughts related to the use of
Facebook, the fourth addressing the ability to abstain from using Facebook, and the fifth
measuring the overall average strength of craving for Facebook over the previous week. The
scale was found to have excellent internal consistency for the current sample ($\alpha = .96$). The
PACS has been previously modified in a similar manner to quantify craving for various
substances (Change, Sommers, & Herz, 2010), as well as other behavioral addictions, such as
gambling (Tavares, Zilberman, Hodgins, & el-Guebaly, 2005).

**Data Analysis**

**Acculturation.** Research has suggested that the construct of “craving” has limited
relevance in many non-Western cultures as illustrated by a lack of truly synonymous translations
of the term in most non-English languages (Hormes & Rozin, 2010). Given the diversity of the
current sample preliminary analyses were conducted separately for U.S. and non-U.S. born
students. Correlations between the variables of interest were examined for the two samples in
order to address whether relationships with craving were comparable and whether they could be
combined for follow up mediation analyses. Regarding the latter, mediation analyses require all
variables (independent, mediator, and dependent variables) to be significantly correlated with each other. To distinguish between U.S. born and non-U.S. born students, the current study utilized the item asking if the participant spent more than 50% of their childhood outside of the United States. Non-U.S. born students were those that reported spending greater than 50% of their childhood outside of the United States.

For the analyses related to alcohol use the results for both samples showed a significant correlation between alcohol craving and both domains of emotion regulation (non-acceptance and impulse control, all $p$’s < .05). Conversely, there was only a significant correlation between thought suppression and alcohol craving in U.S. born students ($p < .001$). Preliminary findings also showed significant correlations between emotion regulation (non-acceptance and impulse control) and thought suppression ($p < .001$ and $p = .002$, respectively) for U.S. born students only. As stated, a significant correlation between all variables must exist in order for mediation to be conducted. Due to this requirement and the preliminary results, only U.S. born students were included in the alcohol mediation analyses. All alcohol related correlations for U.S. and non-U.S. born students are reported in Table 1.

The mediation analyses for Facebook require the same assumptions to be met. That is, significant correlations must be present between emotion regulations deficits (non-acceptance and impulse control) and thought suppression, thought suppression and Facebook craving, and Facebook craving and emotion regulation deficits. Differences between U.S. and non-U.S. born students were also addressed in this analysis to determine the appropriateness of both samples in the mediation. For U.S. born students all correlations were significant (all $p$’s < .05; See Table 3 for full results). For non-U.S. born students only the relationship between thought suppression and Facebook craving was significant, $p < .001$. Due to the non-significant relationships for the
non-U.S. born sample only U.S. born students were used for further analysis. Additional correlations related to the Facebook analysis can be found in Table 2.

**Primary hypotheses.** The two primary hypotheses tested whether thought suppression mediates the relationship between domains of emotion regulation (specifically non-acceptance and impulsivity) and craving for both a substance (alcohol) and behavior (Facebook). The current study employed the use of PROCESS (Hayes, 2013) to test the proposed mediation model hypothesizing that the impact of acceptance and impulsivity on craving for substances (in this case alcohol) and/or behaviors (in this case Facebook use) is mediated by thought suppression, such that the relationship between emotion regulation and craving is reduced when controlling for thought suppression.

**Statistical analysis.** As per Hayes (2013), mediation assumes normality of the measures being used. Therefore, the five scales used were examined prior to further analysis in order to determine if their distribution was normal. Analysis of the descriptive statistics of the scales revealed non-normal distributions. All absolute value skewness statistics were greater than 1.0 and more than two-times the standard error, thus indicating non-normal distributions. All measures underwent appropriate transformations before being used in further analysis. Resulting skewness statistics were less than 1.0 and all ratios between the statistic and standard error were decreased. The original and transformed statistics for each measure are included in Table 3 and Table 4.

**Results**

**Descriptive Statistics**

Of the 629 participants that were eligible for the study, 89.3% (n= 562) were U.S. born students who completed all of the measures and thus were included in further analysis. Of the
562, only those that reported drinking behaviors in the last 12 months (92.8%, n= 522) based on NIAA criteria\(^2\) were included in tests of the alcohol mediation model. Similarly, only those with a current Facebook profile (93.1%, n= 523) were included in the Facebook-related analyses. The final sample used in the alcohol mediation analysis was n= 522 and the final sample for the Facebook mediation analysis was n= 523.

Participants were largely representative of undergraduate students in the United States in terms of age, gender, and race/ethnicity. Ages of participants ranged from 18 to 48, with the average being 19.29 years (SD = 2.63). Of the 562 U.S. born students, 62.3% were female (n= 350) and 37.7% were male (n= 212). The majority of the sample self-identified as Caucasian (57.7%, n= 324). African Americans made up 13.3% (n= 75) of the sample and Hispanic or Latinos made up 11% (n= 62). The remaining 17.9% was comprised of Asian (6.2%, n= 35), American Indian or Alaskan Native (0.4%, n= 2), and Native Hawaiian or Pacific Islander (0.4%, n= 2), or identified as either being of a mixed ethnic background (9.3%, n= 52) or “other” (1.6%, n= 9).

**Alcohol Mediation Model**

**Non-acceptance (Alcohol).** A mediation analysis was conducted using measures of emotion regulation, thought suppression, and alcohol craving. The DERS “non-acceptance” subscale was included as the predictor variable. The hypothesized mediator variable was the total score on the WBSI, which represents the degree of thought suppression. Finally, craving for alcohol use was represented by scores on the PACS and included as the outcome variable. The

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\(^2\) The survey used six questions recommended by the National Institute on Alcohol Abuse and addiction (NIAAA; http://www.niaaa.nih.gov/research/guidelines-and-resources/recommended-alcohol-questions) to determine drinking behaviors over the last years. Individuals who endorsed drinking based on the following question “During the LAST 12 MONTHS, how often did you usually have any kind of drink containing alcohol?” remained in the alcohol mediation analysis.
regression of non-acceptance on the mediator, thought suppression, was significant $b=.340$, $t(488)=3.67$, $p<.001$. When controlling for non-acceptance, thought suppression was found to be a significant predictor of alcohol craving, $b=.157$, $t(488)=3.55$, $p<.001$. The relationship between non-acceptance of negative emotions and craving remained significant when controlling for the mediator, thought suppression, $b=.417$, $t(488)=4.54$, $p<.001$. A Sobel test was conducted and supported the finding of mediation in the model ($z=2.51$, $p=.01$). All values are presented in Table 4.

**Impulse control (Alcohol).** A replication of the previous mediation model was tested with the DERS subscale quantifying impulse control as the predictor variable. Mediator and outcome variable remained the same. Consistent with the previous analysis the regression of impulse control on thought suppression was significant $b=.351$, $t(482)=3.14$, $p=.002$, as was thought suppression on alcohol craving when controlling for impulse control, $b=.137$, $t(482)=3.10$, $p=.002$. The relationship between impulse control and alcohol craving remained significant when controlling for thought suppression, $b=.519$, $t(482)=4.75$, $p<.001$. The Sobel test was significant, indicating mediation in the model ($z=2.15$, $p=.03$). Table 5 includes additional statistics.

**Facebook Mediation Model**

**Non-acceptance (Facebook).** Akin to the proposed alcohol mediation model, analyses were conducted to identify the role of thought suppression in the relationship between emotion regulation deficits and craving for OSN use. Similarly, non U.S.-born students were excluded due to lack of correlation between all utilized variables. The regression of non-acceptance scores on the measure of thought suppression was significant $b=.384$, $t(491)=4.57$, $p<.001$, as well as thought suppression on Facebook craving when controlling for non-acceptance, $b=1.01$, $t(491)=3.27$. The relationship between non-acceptance and Facebook craving remained significant when controlling for the mediator, thought suppression, $b=.342$, $t(491)=3.41$, $p<.001$. A Sobel test was significant, indicating mediation in the model ($z=2.42$, $p=.01$). All values are presented in Table 5.
43.64, $p<0.001$. Mediation for thought suppression was indicated by results showing a non-significant relationship between non-acceptance and Facebook craving when thought suppression was controlled for and a significant Sobel test, $z=4.55$, $p<.001$. See Table 6 for additional statistics supporting this model.

**Impulse control (Facebook).** A final mediation analysis was conducted using impulse control as the predictor, thought suppression as the mediator, and Facebook craving as the outcome variable. Similar to alcohol craving, the relationship between impulse control and Facebook craving, was mediated by thought suppression as indicated by a significant Sobel Test ($z=3.50$, $p<.001$). Additional results are presented in Table 6.

**Discussion**

Addiction research has begun to expand beyond the scope of substance use. This extension includes examining behaviors that can become excessive or addictive, including internet addiction. While this research is fairly novel compared to substance addiction research, it has demonstrated that there are clear similarities between substance and behavioral addictions (Chou et al., 2005; Byun et al., 2009). A core characteristic that appears to maintain both drinking (Fox et al., 2008; Dragan, 2015) and internet use behaviors is the presence of emotion regulation difficulties (Hormes et al., 2014; Kun & Demetrovics, 2010; Weiss, Sullivan, & Tull, 2015). In addition, researchers converge on the idea that both substance and behavioral addictions can lead to craving for the desired substance/behavior prior to engagement in the activity (Hormes et al., 2014; Tiffany, 1990). Emotion regulation difficulties can include a number of deficits, including being non-accepting of one’s internal state and difficulties with

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3 Previous data suggests potential differences in craving for alcohol (Willner, Field, Pitts, & Reeve, 1998) and Facebook (Hormes et al., 2014) among males and females. Therefore, all analyses were conducted with gender as a covariate. Results remained unchanged.
impulse control (Gratz & Roemer, 2004). The presence of these deficits in an individual who engages in risky behaviors, whether it be drinking or excessive internet use, leads to an increase in the behavior as a way to reduce the negative affect (Heilman, Crisan, Houser, Miclea, & Miu, 2010). The primary focus of this study was to examine whether thought suppression acts as a mediating factor between the inabilities to tolerate, modulate, or accept negative affect and/or the inability to control risky behaviors as a way to control negative affect, and the craving for the addictive behavior. That is, the inability to accept one’s negative internal state was hypothesized to lead to an increase in the tendency to try to control one’s thoughts, leading to enhanced frequency and salience of the thoughts to engage in the behavior, leading to an increase in craving for the behavior.

The findings supported this hypothesis and showed that the relationship between emotion regulation difficulties and alcohol and Facebook craving were mediated by thought suppression. This signifies that individuals who have difficulty either accepting their emotions or controlling their impulses may attempt to suppress thoughts related to the desired behavior, which in turn increases the craving for the behavior. These findings are not surprising given that attempts to suppress unwanted thoughts has previously been shown to result in an increase in the salience of the thoughts (Wegner & Erber, 1992), therefore leading to an increase in salient stimuli associated with the thoughts and an increase in behaviors associated with the thoughts (Erksine & Georgiou, 2011). In addition the results of the current study along with findings showing that individuals with Internet Gaming Disorder and alcohol dependence have similar deficits in executive functioning, self-control, and adaptive responding (Han et al., 2015) provide support for the belief that substance and behavioral addictions share many of the same features (Aboujaoude, 2010; Han et al., 2015; Young, 1998; 2004), dispelling the notion that due to the
absence of a toxin behavioral addiction is a different phenomenon than substance dependence (van Deursen, Bolle, Hegner, & Kommers, 2015).

The results from the current study contribute to existing literature showing that tendencies to suppress unwanted thoughts as an attempt to reduce negative affect is unsuccessful and often leads to an increase in craving (Fox et al., 2008), which can trigger a relapse in the avoided behavior (Heilman et al., 2010). Craving as a trigger for relapse has been demonstrated in cocaine and alcohol use (Fox et al., 2007). The use of mindfulness training has been cited as a possible treatment modality for individuals who are at risk for addiction relapse (Bowen, Witkiewitz, Dillworth, & Marlatt, 2007; Garland, Gaylord, Boettiger, & Howard, 2010), focusing on acceptance, non-judgment, and non-reaction to the thoughts, feelings, and sensations as an alternative to the suppression of unwanted thoughts (Bowen et al., 2007). Substance abuse treatments have begun to incorporate mindfulness techniques with positive results (Bowen et al., 2007; Gifford et al., 2004). Bowen and colleagues (2007) found that thought suppression mediated the relationship between meditation and alcohol use. These results combined with the current study’s findings further support the use of mindfulness techniques in reducing thought suppression in the management of substance or behavioral addiction.

Limitations

There are limitations that should be considered when interpreting the results. First and foremost the scales used in the current study were all non-normative. Skewness statistics ranged from .661 to 2.99 in the original sample. Transformations were conducted on each of the scales to obtain a normative distribution. After the transformations the absolute value of the skewness statistics ranged from .017 to .246. While the resulting transformed values were less skewed (signified by their visual distribution, statistics absolute value being less than 1, and decrease in
the ratio between the skewness statistic and the standard error) none of the measures reached a value of zero for skewness and the majority still had a significant statistic for the Shapiro-Wilk test of normality. Future research should use alternative measures that assess the variables of interest or employ more robust statistics to bring the current measures to a normal distribution.

An additional limitation of the current study is the use of scales measuring craving. While craving is related to consumption (Fox et al., 2007; 2008), it is not always related to substance or behavioral addiction (Drummond, Litten, Lowman, & Hunt, 2000). Therefore identifying parallels between this study and previous addiction research should be done cautiously. Replication of this study should include measures related to both alcohol and Facebook consumption and addiction, in addition to craving.

Conclusions

The results of the current study add to existing literature suggesting that thought suppression has some effect on craving and perhaps the engagement in subsequent risky behavior. The present findings provide some insight into potential treatment options for substance and behavioral addictions. It is possible that by targeting craving, which can be an antecedent for relapse (Fox et al., 2007; 2008), may best be accomplished using mindfulness and acceptance techniques. Researchers should continue to attempt to identify what mechanisms are underlying the emotion regulation-craving and/or addiction correlation. By identifying these mediating factors treatments can continue to include nuanced techniques and alternative treatment interventions.
References
Blanco, C., Myers, J., & Kendler, K. S. (2012). Gambling, disordered gambling and their
association with major depression and substance use: a web-based cohort and twin-sibling study. *Psychological medicine, 42*(03), 497-508.


Cole, P. M., Michel, M. K., & Teti, L. O. (1994). The development of emotion regulation and


control in recently abstinent alcoholics compared with social drinkers. *Addictive Behaviors, 33*(2), 388-394.


Rottenberg, J., & Gross, J. J. (2003). When emotion goes wrong: Realizing the promise of


Table 1

Alcohol craving, thought suppression, and emotion regulation correlations for U.S. and non-U.S. born students

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<tr>
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<th>PACS</th>
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</tr>
<tr>
<td>Non-U.S. born</td>
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Table 2

Facebook craving, thought suppression, and emotion regulation correlations for U.S. and non-U.S. born students

<table>
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<td><strong>Non-US born</strong></td>
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Table 3

*Skewness and kurtosis statistics for all scales before and after transformations*

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<td>2.05, .035</td>
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<td>Penn Alcohol Craving Scale-Modified (PACS-FB)</td>
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<td>8.58, .207</td>
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**Table 4**

*Descriptive statistics for all scales after transformations*

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<th>Minimum</th>
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Table 5

*Thought suppression mediation for the relationship between non-acceptance and alcohol craving*

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<th>t</th>
<th>Sig.</th>
<th>R</th>
<th>R²</th>
<th>F</th>
<th>Sig.</th>
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<tr>
<td><strong>PACS</strong></td>
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Sobel Test

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Table 6

*Thought suppression mediation for the relationship between impulse control and alcohol craving*

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Table 7

*Thought suppression mediation for the relationship between non-acceptance and Facebook craving*

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<th>R</th>
<th>R²</th>
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**Sobel Test**

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Table 8

*Thought suppression mediation for the relationship between impulse control and Facebook craving*

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<th>B</th>
<th>SE</th>
<th>t</th>
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<th>R</th>
<th>R²</th>
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Appendix A

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)

Directions: Please indicate how often the following statements apply to you. Use the following scale to help determine your answer:

Almost never (0-10%)
Sometimes (11-35%)
About half the time (36-65%)
Most of the time (66-90%)
Almost always (91-100%)

1. I am clear about my feelings.
2. I pay attention to how I feel.
3. I experience my emotions as overwhelming and out of control.
4. I have no idea how I am feeling.
5. I have difficulty making sense out of my feelings.
6. I am attentive to my feelings.
7. I know exactly how I am feeling.
8. I care about what I am feeling.
9. I am confused about how I feel.
10. When I’m upset, I acknowledge my emotions.
11. When I’m upset, I become angry with myself for feeling that way.
12. When I’m upset, I become embarrassed for feeling that way.
13. When I’m upset, I have difficulty getting work done.
14. When I’m upset, I become out of control.
15. When I’m upset, I believe that I will remain that way for a long time.
16. When I’m upset, I believe that I’ll end up feeling very depressed.
17. When I’m upset, I believe that my feelings are valid and important.
18. When I’m upset, I have difficulty focusing on other things.
19. When I’m upset, I feel out of control.
20. When I’m upset, I can still get things done.
21. When I’m upset, I feel ashamed with myself for feeling that way.
22. When I’m upset, I know that I can find a way to eventually feel better.
23. When I’m upset, I feel like I am weak.
24. When I’m upset, I feel like I can remain in control of my behaviors.
25. When I’m upset, I feel guilty for feeling that way.
26. When I’m upset, I have difficulty concentrating.
27. When I’m upset, I have difficulty controlling my behaviors.
28. When I’m upset, I believe that there is nothing I can do to make myself feel better.
29. When I’m upset, I become irritated with myself for feeling that way.
30. When I’m upset, I start to feel very bad about myself.
31. When I’m upset, I believe that wallowing in it is all I can do.
32. When I’m upset, I lose control over my behaviors.
33. When I’m upset, I have difficulty thinking about anything else.
34. When I’m upset, I take time to figure out what I’m really feeling.
35. When I’m upset, it takes me a long time to feel better.
36. When I’m upset, my emotions feel overwhelming.
Appendix B

White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994)

Directions: The following questions are about thoughts. There are no right or wrong answers, so please respond honestly to each of the items below. Be sure to answer every item by selecting the appropriate response option from the scale below.

1: Strongly Disagree
2: Disagree
3: Neutral or “Don’t know”
4: Agree
5: Strongly Agree

1. There are things I prefer not to think about
2. Sometimes I wonder why I have the thoughts I do
3. I have thoughts that I cannot stop
4. There are images that come to mind that I cannot erase
5. My thoughts frequently return to one idea
6. I wish I could stop thinking of certain things
7. Sometimes my mind races so fast I wish I could stop it
8. I always try to put problems out of my mind
9. There are thoughts that keep jumping into my head
10. There are things that I try not to think about
11. Sometimes I really wish I could stop thinking
12. I often do things to distract myself from my thoughts
13. I have thoughts that I try to avoid
14. There are many thoughts that I have that I don’t tell anyone
15. Sometimes I stay busy just to keep thoughts from intruding on my mind
Appendix C

Penn Alcohol Craving Scale (PACS; Flannery et al., 1999)

NOTE: A craving is defined as a very strong urge or desire that is extremely hard to resist.

Please read each question carefully and select the answer that best describes your craving DURING THE PAST WEEK.

1. In the past week, how often have you thought about drinking or about how good a drink would make you feel?
   a. Never, that is, 0 times during the past week
   b. Rarely, that is, 1 to 2 times during the past week
   c. Occasionally, that is, 3 to 4 times during the past week
   d. Sometimes, that is, 5 to 10 times during the past week or 1 to 2 times per day
   e. Often, that is, 11 to 20 times during the past week or 2 to 3 times per day
   f. Most of the time, that is, 20 to 40 times during the past week or 3 to 6 times per day
   g. Nearly all of the time, that is, more than 40 times during the past week or more than 6 times per day

2. At its most severe point, how strong was your craving during the past week?
   a. None at all
   b. Slight, that is a very mild urge
   c. Mild urge
   d. Moderate urge
   e. Strong urge, but easily controlled
   f. Strong urge and difficult to control
   g. Strong urge and would have drunk alcohol if it were available

3. How much time have you spent thinking about drinking or about how good a drink would make you feel during the past week?
   a. None at all
   b. Less than 20 minutes
   c. 21 to 45 minutes
   d. 46 to 90 minutes
   e. 91 minutes to 3 hours
   f. Between 3 and 6 hours
   g. More than 6 hours

4. How difficult would it have been to resist taking a drink during the past week if you had known a bottle were in your house?
   a. Not difficult at all
   b. Very mildly difficult
   c. Mildly difficult
d. Moderately difficult
  e. Very difficult
  f. Extremely difficult
  g. Would not be able to resist

5. Keeping in mind your responses to the previous questions, please rate your overall average alcohol craving for the past week.
   a. Never thought about drinking and never had the urge to drink
   b. Rarely thought about drinking and rarely had the urge to drink
   c. Occasionally thought about drinking and occasionally had the urge to drink
   d. Sometimes thought about drinking and sometimes had the urge to drink
   e. Often thought about drinking and often had the urge to drink
   f. Thought about drinking most of the time and had the urge to drink most of the time
   g. Thought about drinking nearly all of the time and had the urge to drink nearly all of the time
Appendix D

Penn Alcohol Craving Scale- Modified for Facebook (PACS-FB; Hormes et al., 2014)

*NOTE: A craving is defined as a very strong urge or desire that is extremely hard to resist.*

*Please read each question carefully and select the answer that best describes your craving DURING THE PAST WEEK.*

1. During the past week, how often have you thought about Facebook or about how good checking Facebook would make you feel?
   a. Never, that is, 0 times during the past week
   b. Rarely, that is, 1 to 2 times during the past week
   c. Occasionally, that is, 3 to 4 times during the past week
   d. Sometimes, that is, 5 to 10 times during the past week or 1 to 2 times per day
   e. Often, that is, 11 to 20 times during the past week or 2 to 3 times per day
   f. Most of the time, that is, 20 to 40 times during the past week or 3 to 6 times per day
   g. Nearly all of the time, that is, more than 40 times during the past week or more than 6 times per day

2. At its most severe point, how strong was any craving you felt to check Facebook during the past week?
   a. None at all
   b. Slight, that is a very mild urge
   c. Mild urge
   d. Moderate urge
   e. Strong urge, but easily controlled
   f. Strong urge and difficult to control
   g. Strong urge and did check Facebook/ would have checked Facebook if it had been possible
   h. Not applicable (do not have or use Facebook)

3. How much time have you spent thinking about Facebook or about how good checking Facebook would make you feel?
   a. None at all
   b. Less than 20 minutes
   c. 21 to 45 minutes
   d. 46 to 90 minutes
   e. 91 minutes to 3 hours
   f. Between 3 and 6 hours
   g. More than 6 hours
   h. Not applicable (do not have or use Facebook)

4. During the past week, how difficult would it have been to resist checking Facebook if you had made an effort to stay off the site?
a. Not difficult at all
b. Very mildly difficult
c. Mildly difficult
d. Moderately difficult
e. Very difficult
f. Extremely difficult
g. Would not be able to resist
h. Not applicable (do not have or use Facebook)

5. Keeping in mind your responses to the previous questions, please rate your overall average craving to log on to Facebook/ check Facebook or Facebook notifications during the past week.
   a. Never thought about Facebook and never had the urge to log on/ check it
   b. Rarely thought about Facebook and rarely had the urge to log on/ check it
   c. Occasionally thought about Facebook and occasionally had the urge to log on/ check it
   d. Sometimes thought about Facebook and sometimes had the urge to log on/ check it
   e. Often thoughts about Facebook and often had the urge to log on/ check it
   f. Thought about Facebook most of the time and had the urge to log on/ check it most of the time
   g. Thought about Facebook nearly all of the time and had the urge to log on/ check it nearly all of the time
   h. Not applicable (do not have or use Facebook)