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Perfectionism, alcohol intoxication, and deliberate self-harm in men and women

Lissa N. Mandell
Mississippi State University, lissamandell@gmail.com

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By

Lissa N. Mandell

Approved by:

Mitchell E. Berman (Major Professor)
Mary E. Dozier
Michael S. Pratte
Kevin J. Armstrong (Graduate Coordinator)
Rick Travis (Dean, College of Arts & Sciences)

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Name: Lissa N. Mandell

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Major Professor: Mitchell E. Berman

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Previous research has demonstrated associations between deliberate self-harm (DSH) and perfectionism, although most of that research used retrospective self-report measures of DSH, which are prone to various cognitive biases. Although perfectionism has been associated with alcohol abuse, no research has examined how alcohol intoxication may moderate the relation between perfectionism and DSH. The aims of this experimental study were to determine if perfectionism is associated with a laboratory analogue of DSH (the Self-Aggression Paradigm) and examine the role of alcohol intoxication as a potential moderator. Using archival data, blood alcohol content (BAC) was manipulated by randomly assigning participants to reach one of four target BACs. Results indicated that perfectionism was not associated with DSH (mean self-administered shock or number of "severe" shocks). There was no interaction between perfectionism and BAC. These findings are discussed within the context of the perfectionism measure's psychometric characteristics and the strength of previous research findings.

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CHAPTER I

INTRODUCTION

Although perfectionism is not a mental disorder by itself, trait perfectionism can substantially contribute to distress, diagnosable psychopathology, and impairment in functioning. Thus, it is of considerable importance in the field of clinical psychology. Perfectionism includes setting extremely high standards for oneself, reacting poorly when one makes a mistake, doubting the quality or accuracy of one's actions, and a strong focus on neatness or organization (Frost et al., 1990). In addition, perfectionism can include an individual's belief that other people expect them to be perfect (socially prescribed perfectionism; Stoeber, 2014). In most cases (including the present study), the term "perfectionism" is used to refer to self-oriented perfectionism (internally motivated perfectionism imposed on oneself) or socially prescribed perfectionism (perfectionism due to other's expectations). Occasionally, researchers examine other-oriented perfectionism (an individual expecting *other* people to be perfect). Given that other-oriented perfectionism is quite different from self-oriented or socially prescribed perfectionism, other-oriented perfectionism is not a focus of the current research study.

Perfectionism is not always harmful. For example, setting high goals for oneself should not, by itself, be considered a problem. However, excessive work (such as to the point of burnout), anxiety, and negative emotions associated with different aspects of perfectionism can be detrimental to an individual's functioning and mental wellbeing (Harari et al., 2018). Indeed, perfectionism is a risk factor for the development of eating disorders (EDs), as well as the

maintenance of obsessive-compulsive disorder, social anxiety, and depression (Egan et al., 2011). Perfectionism that interferes with task completion is listed as one of eight potential diagnostic features (criteria) for obsessive-compulsive personality disorder (OCPD) in the DSM-5 (American Psychiatric Association, 2013). Perfectionism plays an even larger role in OCPD as conceived by the Alternative DSM-5 Model for Personality Disorders (AMPD); in the AMPD, "rigid perfectionism" is an *essential* feature of OCPD (American Psychiatric Association, 2013).

Another negative consequence of perfectionism may be self-harm, such as suicidality (O'Connor, 2007) and non-suicidal self-injury (NSSI; e.g., cutting, burning, without lethal intent). However, almost all of the literature on this topic relies on self-report measures of self-harm, which may be strongly influenced by social desirability and recall biases (Hamza & Willoughby, 2015). Studying self-harm using laboratory methods in a controlled laboratory environment may reduce these sources of bias and also allows for experimental manipulations to identify causal influences on self-harm. Given NSSI's association with indices of suicidal behavior, as well as the deleterious effects of NSSI *per se*, the lack of laboratory research on the relationship between perfectionism and non-lethal self-harm appears to be an important gap in the literature. Thus, the first aim of the current study is to examine the relation between perfectionism and non-lethal self-harm observed under controlled laboratory conditions using a well-validated behavioral analogue of deliberate self-harm (Berman et al., 2005; Berman & Walley, 2003; McCloskey et al., 2008, 2012). The second aim is to determine if the association between perfectionism and deliberate self-harm is moderated by experimentally manipulated levels of alcohol intoxication. This second aim is supported by the known association between alcohol and deliberate self-harm and a linkage between alcohol abuse and perfectionism. Relevant literature is reviewed below.

Overview of NSSI

Non-suicidal self-injury (NSSI) can be defined as "…the direct and deliberate destruction of one's own bodily tissue in the absence of lethal intent and for reasons not socially sanctioned" (Cipriano et al., 2017, p. 1) such as cutting, scratching, burning, or hitting oneself. A systematic review and meta-analysis of NSSI in nonclinical samples reported estimated lifetime prevalence rates of 17.2% in adolescents, 13.4% in young adults, and 5.5% in adults (Swannell et al., 2014); the authors speculated that the lower reported lifetime prevalence rates in older age groups may be due to recall bias. NSSI is sometimes called "deliberate self-harm (DSH)," despite the inconsistent definition of "DSH" in the literature; many define "DSH" as a synonym of NSSI, but some also include suicidal behavior in their definition of "DSH" (Mangnall & Yurkovich, 2008). However, the laboratory assessment of "self-harm" in the current study (electric shock) is not a typical method of "NSSI," and thus the term "DSH" will be used here to refer to intentional self-harm without suicidal intent.

Previous research supports the notion that NSSI can serve several functions. The most commonly described function is affect regulation; that is, engaging in NSSI "to alleviate acute negative affect or aversive affective arousal" (Cipriano et al., 2017; Klonsky, 2007). This includes self-injurers who endorsed functions such as "tension release," "distraction from painful feelings," or "manage stress" (Klonsky, 2007). Self-reports about previous NSSI experiences, along with measures administered before and after laboratory tasks that served as proxies for NSSI, provide additional research support for this function, as studies frequently report decreases in negative affect after NSSI or a proxy for it (Hamza & Willoughby, 2015; Klonsky, 2007).

Another function with strong research support is self-punishment; that is, engaging in NSSI "to derogate or express anger towards oneself" (Cipriano et al., 2017; Klonsky, 2007). This

includes self-injurers who endorsed reasons such as "to punish myself for being 'bad,'" "I felt like a failure," or "I was angry at myself" (Klonsky, 2007). Less common functions of NSSI include anti-dissociation (feeling generation), interpersonal-influence, interpersonal boundaries, anti-suicide, and sensation-seeking functions (Klonsky, 2007).

Although the immediate consequences of NSSI are obviously not as severe as those of a fatal suicide attempt, NSSI is still of clinical concern due to its potential consequences. For example, NSSI may lead to interpersonal difficulties with family and friends (Burke et al., 2017). Shame and guilt about engaging in NSSI may lead an individual to isolate themselves from others, even further exacerbating psychological problems and interpersonal difficulties. Physical scarring resulting from NSSI may be distressing due to its perceived stigma. More importantly, a history of NSSI is often considered a risk factor for suicidal behavior (i.e., suicide attempts), as shown by the results of cross-sectional and longitudinal studies (Hamza et al., 2012). Various explanations for this relationship have been proposed. The "Gateway Theory" conceptualizes NSSI and death by suicide as two ends of a continuum of self-harm behaviors, such that NSSI is a "gateway" form of self-harm that can escalate to engaging in more severe forms of self-harm, such as suicide attempts (Hamza et al., 2012). Joiner's Interpersonal Theory of Suicide proposes that the progression from suicidal ideation to suicide attempt requires "acquired capability" for suicide, defined as increased pain tolerance and decreased fear of death (Hamza et al., 2012; Joiner, 2005). In this theory, Joiner proposes that painful and provocative experiences (such as NSSI) increase the risk for suicidal behavior by desensitizing an individual to pain and fear of death, thereby developing an acquired capability for suicide. Whatever the actual mechanism behind the observed relationship between NSSI and suicidality, NSSI's role as a risk factor for

suicide attempts, as well as the deleterious effects of NSSI alone, suggest that investigation of the correlates and causes of NSSI is a critical need for the field of self-harm.

Perfectionism and NSSI

Many studies have examined the relationship between perfectionism and NSSI, although almost all of them used self-report measures of NSSI, rather than laboratory analogues of DSH. Overall, much of the previous literature has demonstrated positive associations between NSSI and different aspects of perfectionism. For example, Arthurs and Tan (2017) categorized participants recruited from educational institutions and the general community into three categories: High NSSI (10 or more lifetime incidents of NSSI *or* using 3 or more NSSI methods), Low NSSI (1-9 lifetime incidents of NSSI *and* using 1 to 2 NSSI methods), and No NSSI. They found that participants in the High NSSI group scored higher on a measure of the early maladaptive schema "Unrelenting Standards" (high standards for oneself – an aspect of perfectionism) compared to the Low NSSI and No NSSI groups.

Many studies have examined the relation between NSSI and perfectionism in college or university students. For example, Flett and colleagues (2012) found that among students who recently started university, increased NSSI was associated with self-punitive attitudes (i.e., self-criticism and overgeneralization of failures) and socially prescribed perfectionism, but only among women. Self-oriented perfectionism and other domains of perfectionism (e.g., personal standards) were not associated with NSSI among women or men.

Daigle and colleagues (2018) examined perfectionism's relationship with recent NSSI (past 6 months) in a sample of 1,500 university students. For women, in multiple logistic regression analyses examining the influence of different components of perfectionism, higher doubts about actions and parental criticism (components of the Frost Multidimensional

Perfectionism Scale [FMPS]; Frost et al., 1990) were associated with recent NSSI. However, *lower* organization (orderliness and neatness; another component of the FMPS) was associated with recent NSSI in females. In addition, concern over mistakes, personal standards, and parental expectations were not associated with recent NSSI. For men, none of the FMPS subscales were associated with recent NSSI.

In a study of 170 college students, individuals with a lifetime history of NSSI scored higher on the concern over mistakes and parental criticism subscales of the FMPS than did individuals without a history of NSSI (Hoff & Muehlenkamp, 2009). Participants with a history of NSSI scored *lower* on the FMPS organization subscale than did participants without a history of NSSI. There were no group differences for the personal standards, parental expectations, or doubts about actions subscales. However, in a logistic regression model that also controlled for depression and anxiety, the group differences for concern over mistakes and parental criticism were no longer significant.

Another study of college students investigated the relations between perfectionism, social problem-solving style, and NSSI (Lucas et al., 2019). Using hierarchical regression analyses, the six domains of the FMPS were entered into a model in the same step. Concern over mistakes, but not the other five FMPS subscales (personal standards, parental expectations, parental criticism, doubts about actions, and organization), was a unique predictor of greater NSSI behaviors. In a separate hierarchical regression where social problem-solving variables were entered into the model in step 1 and the perfectionism variables were entered in step 2, concern over mistakes was again the only FMPS subscale that was a unique predictor of greater NSSI behaviors.

As part of their psychometric evaluation of the Personality Inventory for DSM-5 and the Computer Adaptive Test of Personality Disorder, Yalch and Hopwood (2016) examined the

association between traits and various criterion variables assessed in university students. One of the criterion variables was NSSI, which was assessed continuously using the Deliberate Self-Harm Inventory (DSHI; Gratz, 2001). Perfectionism (r = .14), rigidity (r = .16), and workaholism (r = .08) were all significantly positively associated with NSSI. However, these effects were small in magnitude and among over 350 correlations presented, and therefore the Type I error rate is likely inflated. Accordingly, Yalch and Hopwood's results do not convincingly support an association between perfectionism and NSSI.

Several studies that examined the relation between perfectionism and NSSI used all-female samples. For example, Chang and colleagues (2019) found that evaluative concerns perfectionism (i.e., FMPS Concern Over Mistakes plus FMPS Doubts About Actions) uniquely predicted greater lifetime NSSI behaviors among women college students, even after controlling for sexual assault history. In another female-only study, Claes and colleagues (2012) examined past-year NSSI in a sample of 95 women receiving inpatient treatment for eating disorders. In this sample, after controlling for ED severity, participants who endorsed past-year NSSI tended to have higher scores on FMPS evaluative concerns perfectionism and perceived parental criticism than those who did not report past-year NSSI. However, the two groups did not differ on personal standards perfectionism. Another study with an all-female sample found that ED patients with recent (past month) NSSI scored higher on a measure of perfectionism than ED patients without recent NSSI and healthy controls (Fujimori et al., 2011). A study of adult female psychiatric patients (with eating disorders or borderline personality disorder) and female adolescents from the community found that higher perfectionism was associated with a greater likelihood of endorsing a lifetime history of NSSI in both the adult psychiatric patient and community adolescent samples (Luyckx et al., 2015).

Of those all-female studies, two exclusively recruited individuals with EDs and one had a sizeable portion of the sample consist of individuals with EDs. However, males can also develop EDs, so mixed gender samples are valuable. In a study of 109 adolescents (95 females and 14 males) receiving treatment for eating disorders, participants with a history of NSSI scored higher on the Child and Adolescent Perfectionism Scale (CAPS) and the Perfectionism subscale of the Eating Disorder Inventory-2 (EDI-2) than participants without a history of NSSI (Varela-Besteiro et al., 2017). However, when the CAPS subscales (self-oriented perfectionism and socially prescribed perfectionism) were examined separately, the subscale scores did not differ by NSSI history.

To my knowledge, only one study (Chester et al., 2015) has used a laboratory analogue of self-harm to examine the association between (maladaptive) perfectionism and self-harm. In that study, maladaptive perfectionism was measured using the Discrepancy subscale of the Almost Perfect Scale-Revised; this subscale assesses the feeling of discrepancies between one's perceived achievement and one's self-imposed high standards. Undergraduate student participants first wrote an essay and were told that their essay would be "evaluated" by a "same-sex undergraduate completing the same study"; in reality, participants were actually randomly assigned to receive positive or negative feedback on their writing. After receiving feedback, participants were then prompted to select a number of pins to put into a virtual voodoo doll that represented themselves "to punish you for your performance on the previous essay task." In both the negative feedback and positive feedback conditions, maladaptive perfectionism was positively associated with the number of pins placed in the voodoo doll. However, using a virtual voodoo doll is not a validated laboratory analogue of self-harm, especially since it does not involve pain or ostensible harm. In addition, by giving guidance that the task is for self-

punishment, this can create a potential demand characteristic. Instructions for other tasks like the Self-Aggression Paradigm do not reveal that the goal is for participants to harm or punish themselves, but rather use a cover task.

In summary, several studies have found certain aspects of perfectionism to be positively associated with NSSI. Given that NSSI can be used as self-punishment, this relationship may be due to self-punitiveness and self-criticism that are often components of perfectionism (Claes et al., 2012; Flett et al., 2012). Perfectionism is also related to negative affect (Castro et al., 2017; Stoeber et al., 2014), and negative affect often serves as a trigger for NSSI (Klonsky, 2007).

It should be noted that existing research on this topic has a few weaknesses. The existing literature presents mixed findings regarding which aspects of perfectionism are associated with NSSI, and a few studies reported null findings for men but not women. In addition, the available body of literature almost entirely uses self-report measures of NSSI, rather than laboratory measures of self-harm, which means that these results may be heavily influenced by social desirability and recall biases. Only one (Chester et al., 2015) used a laboratory analogue for DSH to examine self-harm in real-time, and that laboratory analogue was not validated in previous studies. Additional research using laboratory analogues for DSH is needed in order to reduce sources of bias associated with self-report methods, view the occurrence of DSH in real-time, and examine the effects of experimental manipulations.

Alcohol and NSSI

Alcohol use is another factor that has been linked to NSSI in several studies. For example, a survey of 439 adults in the United States found that among those who reported a history of NSSI, 20% reported that they had engaged in NSSI while under the influence of alcohol or drugs (Klonsky, 2011). In addition, individuals who reported a lifetime history of

NSSI were more likely to have received treatment for alcohol or drug use than individuals who did not report a history of NSSI. However, it is possible that this study's results may reflect a difference in help-seeking behaviors rather than the actual prevalence of alcohol or drug use. On the other hand, results of other studies suggest that there are positive associations between alcohol abuse and NSSI even when help-seeking is not considered. In a separate study conducted in Spain, young male inmates with a recent history of NSSI (i.e., engaged in NSSI while at the penitentiary) had higher alcohol dependence scores on the Millon Clinical Multiaxial Inventory II (MCMI-II) than those without a recent history of NSSI (Mohino Justes et al., 2004). In a study of young adults in Australia, greater lifetime NSSI was associated with higher scores on the AusAUDIT (a measure of harmful or hazardous drinking) (F. Williams & Hasking, 2010).

Similar results have been found in college students. For example, MacLaren and Best (2010) categorized undergraduate participants into three categories: High NSSI (10 or more lifetime incidents of NSSI *or* using 3 or more NSSI methods), Low NSSI (1-9 lifetime incidents of NSSI *and* using 1 to 2 NSSI methods), and No NSSI. Participants in the High NSSI group had higher rates of lifetime alcohol abuse than participants in the Low NSSI and No NSSI groups. Participants in the Low NSSI group also had a higher rate of alcohol abuse than the No NSSI group.

Although the research above suggests a relation between alcohol use and NSSI, all of those studies measured alcohol use and NSSI retrospectively using self-report measures and non-experimental designs, so causal inferences cannot be made. However, research using experimentally manipulated alcohol intoxication and the prospective observation of DSH using laboratory analogues provides compelling evidence for a causal relation between alcohol intoxication and DSH. For example, McCloskey and Berman (2003) conducted a study with 40

men in which each participant was randomly assigned to drink alcohol (target blood alcohol content [BAC]: .10) or a placebo drink. Each participant then completed a reaction-time task that they were told was a "competition" against another "participant"; in reality, there was not another participant, and the "wins" and "losses" were predetermined and not connected to reaction time performance. Before each trial, the participant chose a level of electric shock that they would be given if they ended up "losing" that trial. (This procedure, called the Self-Aggression Paradigm [SAP], is described in further detail later.) Intoxicated participants tended to select higher-intensity shocks than non-intoxicated participants. Intoxicated participants were also more likely to self-administer at least one "severe" shock (one that they believed could cause tissue damage and was above their pain tolerance) than non-intoxicated participants. In a separate study of 40 men using a modified version of the SAP (no fake competition and using a veridical control no-alcohol drink), number of self-administered "severe" shocks was compared by alcohol condition (alcohol vs. no alcohol) and experimentally-manipulated self-focused attention (using a camera and a mirror to project an image of the participant's face vs. not doing so) (Berman et al., 2009). Intoxicated participants in the high self-awareness condition did not administer a greater number of severe shocks than non-intoxicated participants, but intoxicated participants in the low self-awareness condition administered a greater number of severe shocks than non-intoxicated participants. A larger study of 210 men and women found that participants in the medium (.075%) or high (.100%) BAC conditions were more likely to select a severe shock than participants in a placebo drink condition (Berman et al., 2017). The current study uses archival data from the latter study to test novel predictions about perfectionism, alcohol intoxication, and DSH.

Although the potential mechanisms behind the alcohol-SAP findings are unknown, it is possible that alcohol intoxication's disruption of risk-taking judgments and executive functioning may play a role in increasing DSH (Fromme et al., 1997; Giancola, 2000; Guillot et al., 2010; McCloskey & Berman, 2003). Alcohol intoxication may also decrease self-awareness, and since previous research has suggested that self-awareness plays a role in following social norms and reduction of deviant or extreme behaviors, alcohol intoxication may interfere with that (Berman et al., 2009; Hull et al., 1983). Despite the lack of clarity regarding the processes underlying this relation, the SAP findings play a critical role in demonstrating a causal relationship between alcohol intoxication and DSH.

Alcohol and Perfectionism

In addition to other negative consequences and correlates previously discussed, alcohol abuse is another detrimental behavior that has been linked to perfectionism. Connections between perfectionism and alcohol abuse have been observed by clinicians and researchers for decades. For example, when describing recurring themes in group therapy for people with alcohol use disorder (AUD), Sands and colleagues (1967) remarked that many people with AUD are high in perfectionism and have extremely high standards for themselves. These individuals often feel like they are not achieving enough, even when others praise them for their successes. These feelings of inadequacy and perceived failure may cause psychological distress, such as anxiety and depression. Similarly, in a study comparing people with AUD to control participants without AUD, Williams and colleagues (1982) found that participants with AUD listed more unmet expectations, including self-imposed expectations, than participants without AUD. Participants with AUD also had more anxiety related to failure to meet expectations than participants without AUD; expectedly, most participants with AUD admitted to using alcohol as

a coping strategy to relieve stress and anxiety, suggesting that high expectations for oneself may contribute to alcohol consumption.

More recent research has also supported proposed connections between perfectionism and AUD. For example, a study examining women with eating disorders found that compared to participants without comorbid DSM-IV alcohol use disorders, participants with comorbid AUD tended to have higher total scores on the Frost Multidimensional Perfectionism Scale, along with higher scores on the FMPS subscales concern over mistakes, doubts about actions, parental criticism, and parental expectations (Bulik et al., 2004). However, scores on the organization and personal standards subscales did not differ by AUD comorbidity.

Smith (2019) explored aspects of the Measures of Constructs Underlying Perfectionism (M-CUP; Stairs et al., 2012) in a sample of participants with AUD. The author found that participants with AUD had higher scores on the "Black and White Thinking" (e.g., "I will not do something if I cannot do it perfectly") and "Details and Checking" (e.g., "It takes me a long time to do something because I check my work many times") subscales than the original college student sample used for initial scale validation. The Details and Checking subscale in particular is similar to common traits found in people with obsessive-compulsive personality disorder: preoccupation with details and perfectionism that interferes with task completion.

Some studies have examined perfectionism's relationship with alcohol use in response to negative affect or as a coping mechanism. In a sample of 406 undergraduate women, socially prescribed perfectionism (but not self-oriented perfectionism) at Time 1 predicted self-reported difficulty controlling alcohol consumption while experiencing negative affect at Time 2 (Bardone-Cone et al., 2012). In addition, socially prescribed perfectionism at Time 1 moderated the relation between weekly self-reported stress (between Time 1 and Time 2) and difficulty

controlling drinking at Time 2: for women with high levels of socially prescribed perfectionism, high levels of stress were positively associated with difficulty controlling drinking, but this association was not present for women with low levels of socially prescribed perfectionism. In a sample of 354 college students, maladaptive perfectionists reported higher levels of drinking to cope than adaptive perfectionists and non-perfectionists (Rice & Van Arsdale, 2010).

Mackinnon and colleagues (2019) used a daily diary method to examine daily ratings of perfectionistic cognitions (e.g., "I expect to be perfect"), non-display of imperfection (i.e., attempting to hide imperfect behaviors from others), negative affect, alcohol-related problems, and motives for alcohol consumption. In this sample of 263 young adults, on days where participants drank alcohol, non-display of imperfection (but not perfectionistic cognitions) indirectly predicted alcohol-related problems through negative affect, coping motives for drinking, and conformity motives for drinking. The authors surmised that non-display of imperfection may be particularly problematic because individuals who attempt to hide their imperfections often have difficulty modifying their presentation to others (Hewitt et al., 2003), which exacerbates feelings of inadequacy, causing further interpersonal and alcohol-related problems.

Although many studies have found perfectionism to be positively associated with AUD or other alcohol-related problems, a few studies have found negative or null associations between perfectionism and alcohol use or abuse. For example, in a study of 242 first-year college students, perfectionism was *negatively* associated with self-reported frequency of alcohol consumption (Pritchard et al., 2007). However, lower frequency of alcohol consumption does not necessarily indicate less problematic drinking (Chiva-Blanch & Badimon, 2019; Siciliano et al., 2013); for example, drinking a glass of wine with dinner every night is more frequent, but likely

less problematic, than binge drinking every weekend. In a separate study of first-year university students, individuals who reported 2 or more binge-drinking episodes in the past two weeks had *lower* levels of self-oriented perfectionism and *higher* levels of parental criticism compared to those who reported less than 2 binge-drinking episodes in the past two weeks, but they did not differ on levels of personal standards (Flett et al., 2008). In another investigation focused on college students, a short-term longitudinal study of undergraduate women found that a reformulated "Perfectionism Model of Binge Eating" predicted binge *eating* over the three-week study, but not binge *drinking* (Mackinnon et al., 2011). However, as the authors of the latter study point out, college students who are high in perfectionism may end up in fewer situations conducive to binge drinking (e.g., parties) because they are concerned about their academic performance and try to avoid activities that would interfere with it (e.g., drinking to the point of a hangover).

Despite the abundance of correlational studies linking alcohol use and perfectionism, little research has examined the *experiences* of drinking alcohol in people who are high in perfectionism. Nealis and Mackinnon (2018) performed one of the few existing studies on this topic by qualitatively exploring drinking narratives among perfectionist undergraduate students (6 adaptive perfectionists and 14 maladaptive perfectionists). Many perfectionists described using alcohol as a form of escapism, such as to distract oneself from negative emotions stemming from harsh self-criticism, high standards, and self-perceived failure. Several perfectionists described guilt and regret over incidents of heavy alcohol use and how they acted while intoxicated; some described limiting their alcohol intake to avoid such situations. Although the sample size was too small to compare theme frequency between adaptive perfectionists and

maladaptive perfectionists, there was a trend in themes of alcohol-related "social friction" being more common among maladaptive perfectionists than among adaptive perfectionists.

In summary, several studies have found associations between aspects of perfectionism (especially maladaptive perfectionism) and alcohol abuse using observational self-report methods. Although people who are high in perfectionism may self-report different levels of alcohol use or abuse than people who are low in perfectionism, it is not known if these groups react *differently* to alcohol use. Very little research has examined how perfectionism may relate to reactions to alcohol intoxication, and the little research that has done so has relied on retrospective self-report methods (Nealis & Mackinnon, 2018). To my knowledge, there have been no studies that examined the reactions of people who are high in perfectionism to experimentally manipulated BAC with respect to DSH.

Despite the current lack of experimental research on this topic, one can speculate on potential associations that may be found in an experimental study and potential reasons for those relationships. One can consider the well-supported "alcohol myopia" model, which proposes that alcohol narrows an individual's attention so only the most salient cues are considered, ignoring less salient inhibitory cues (Giancola et al., 2010; Steele & Josephs, 1990). In a Self-Aggression Paradigm procedure (as described earlier), it is plausible that alcohol myopia may cause an intoxicated person who is high in perfectionism to pay more attention to salient negative perfectionistic thoughts when they lose reaction time trials, which could cause them to administer stronger shocks for emotion regulation or self-punishment purposes. In contrast, since alcohol may sometimes cause elevated mood and a reduction in anxiety (Sayette, 2017), especially when combined with distracting activities (Steele & Josephs, 1990), it is also plausible that people who are high in perfectionism may find alcohol consumption and the SAP procedure

(which could count as a distracting activity) to be a welcome break or distraction from anxious perfectionistic thoughts that they are typically occupied with in their "real lives." However, that explanation assumes that the influence of distraction from "real world" perfectionistic thoughts is more powerful than the influence of doing poorly on the reaction time trials. When examining these two possible directions for how alcohol intoxication may moderate the relationship between perfectionism and DSH, previous research does not provide enough evidence to support one direction over the other, so exploration of this possible moderation (without a specific prediction about which direction) is warranted.

Summary of Current Gaps in the Literature

The current state of the literature has a few notable limitations. First, the available literature on perfectionism and alcohol almost exclusively focuses on associations between perfectionism and alcohol use or abuse, rather than examining the reactions of people who are high in perfectionism to alcohol or how alcohol may moderate the relation between perfectionism and DSH. Second, for every topic discussed so far, almost every study has used correlational methods and very little research has used laboratory or experimental methods, which limits causal inferences or statements regarding directionality.

Current Study

The current study consists of secondary analyses of an archival dataset; the original study primarily investigated the relationship between alcohol intoxication and a laboratory analogue of DSH using the SAP procedure (Berman et al., 2017). In the original study, BAC was experimentally manipulated by randomly assigning participants to receive different dosages of alcohol. Self-harm was operationalized as the level of shock intensity selected to be self-

administered during the “reaction time” trials. Both the mean shock level and the number of “severe” (ostensibly tissue-damaging) shocks will be examined here, as they have both been reported as outcomes in earlier SAP studies (Berman et al., 2017; McCloskey et al., 2012; McCloskey & Berman, 2003). The effect of BAC on DSH is not of considerable interest here because that has already been examined in previous research, including the initial analysis of this dataset (Berman et al., 2017), but BAC is included as a potential moderator in the current analyses. I predicted that perfectionism would be positively associated with mean self-administered shock level and the number of self-administered severe shocks, when including gender as a covariate and BAC as a moderator.

CHAPTER II

METHOD

This study used an archival dataset that includes data collected from 2006-2008 (Berman, 2004-2008). The main purpose of the larger study was to examine the influence of alcohol intoxication on deliberate self-harm (specifically, a laboratory analogue of DSH) (Berman et al., 2017). Participants were recruited from a community in the Southern United States to participate in a study examining "the effects of alcohol on motor skills." The original dataset contained 210 participants; however, 10 participants were missing data on perfectionism. Therefore, the sample that was used for this analysis consists of 200 participants (49.5% female, 50.5% male; 65.0% Caucasian, 25.0% African American, 4.0% Hispanic, 6.0% Other) who ranged in age from 21 to 54 years ($M = 26.18$, $SD = 7.10$).

Study procedures and the consent process were approved by the University of Southern Mississippi Human Subjects Protection Review Committee before data collection began. As part of the study's inclusion criteria, all participants completed a measure of alcohol use and were categorized as "healthy social drinkers." Specifically, individuals who were interested in participating were administered the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993). The determination of "healthy social drinker" was first made by examining the AUDIT score. AUDIT scores of ≤ 7 counted as "healthy social drinking" without the need for further examination. Individuals who scored 8 or 9 on the AUDIT were then administered the Short Michigan Alcoholism Screening Test (SMAST; Selzer et al., 1975), and

they were classified as "healthy social drinkers" if their SMAST score was ≤ 3. Individuals who never drank alcohol or scored above the designated AUDIT or SMAST cutoffs were excluded from participation. Other exclusion criteria included previous participation in an alcohol- or shock-related study in the same lab; currently prescribed medication that would negatively interact with alcohol; pregnancy or breastfeeding; current severe psychological problem requiring treatment; medical conditions that were contraindicated for alcohol consumption or electric shock; or inability to follow a 1-week lead-in protocol before the study session (i.e., no medication that could interact with alcohol for one week before the appointment, no alcohol consumption for 48 hours before the appointment, and no food on the day of the appointment). On the day of the SAP appointment, participants who had a positive urine toxicological screening (for cannabis, opioids, benzodiazepines, methamphetamine, or cocaine), an expired-breath BAC > .000%, reported receiving treatment for substance use, or reported a suicide attempt or NSSI requiring medical attention within the past year were excluded from further participation.

In order to reduce participant fatigue, the alcohol and SAP administration procedures were conducted on a different day than most of the personality and behavior questionnaires. In most cases, the alcohol/SAP procedure was conducted on Day 1 and the personality and behavior questionnaires were administered on Day 2.

Materials and Procedures

Perfectionism

Perfectionism was assessed using the OCPD scale of the Schedule for Nonadaptive and Adaptive Personality-2 (SNAP-2; Clark et al., 2007). Participants completed the SNAP-2 on a different day than the alcohol consumption and SAP procedure. The SNAP-2 is a 390-item

measure that assesses various personality traits, including normative/adaptive traits and maladaptive traits that may indicate the presence of a personality disorder or other psychopathology. Individuals respond to each of the items with "true" (1) or "false" (0). According to the SNAP-2's creators, the SNAP-2 was developed through a multi-stage process to optimize its psychometric properties, and its full scales ultimately demonstrated good reliability and validity in normative and patient samples. The SNAP-2 includes scales for each personality disorder included in the DSM-IV; each of the personality disorder scales includes items that correspond to each of the possible diagnostic criteria for that personality disorder. The OCPD scale consists of 25 items, each of which corresponds to one of the eight diagnostic criteria for OCPD in the DSM-IV or DSM-5.

The perfectionism criterion on the OCPD scale consists of three items: "I don't consider a task finished until it's perfect," "I sometimes have a hard time finishing things because I want them to be perfect," and "Taking care of details is not my strong point" (reverse-scored). For the analyses, the perfectionism dimension score (0, 1, 2, or 3) was calculated by reverse-scoring one item and then calculating the sum of the three perfectionism items.

Blood Alcohol Content

Each participant was randomly assigned to reach one of four target BACs: .000% (placebo), .050% (low dose), .075% (medium dose), or .100% BAC (high dose). Participants in the low, medium, and high dose groups were given two cups that each contained a mixture of chilled orange juice and 190-proof (95% ethanol) grain alcohol in a 5:1 orange juice to alcohol ratio. The volume of the drinks was determined using an equation that adjusted for sex and weight in order to reach the target BAC. The placebo group was given the same volume of orange juice as those in the medium dose condition; to provide the taste of alcohol without

adding an intoxicating amount of alcohol to the placebo drinks, alcohol was rubbed along the cups' rims and a few drops of alcohol were added to the surface of the drinks. All participants (including placebo group participants) were told that the drinks "may contain alcohol," but they were not told how much alcohol was in the drinks.

Participants were given 15 (low dose), 22.5 (placebo and medium dose), or 30 (high dose) minutes to consume the drinks. There was a 20-minute waiting period after drink completion so participants would reach the target BAC during the components of the SAP task (pain tolerance assessment and reaction time task). BAC was measured before and after the SAP procedure using an Alco-Sensor IV (Intoximeters, Inc., St. Louis, MO) hand-held breathalyzer; these two BACs were averaged to yield the BAC value that is used in analyses. Group assignment based on dose was not used in analyses because natural biological variations between participants caused some participants' actual BACs to slightly differ from the "target" BAC they were assigned to; when examining the distribution of actual BACs by group, it was found that different groups' distributions overlapped with each other.

Laboratory Analogue of DSH

The Self-Aggression Paradigm (SAP) (Berman & Walley, 2003; McCloskey & Berman, 2003) was used as a laboratory analogue of DSH. The SAP allows the participant to engage in a form of mild deliberate self-harm (low-voltage electric shocks) in a controlled laboratory environment; here, the "DSH" inflicted may be painful but would not actually result in tissue damage, although the participant is led to believe that it might occur. Previous research has demonstrated the validity of the SAP in various ways (Berman et al., 2017). The SAP's convergent validity has been supported by its positive associations with self-reported NSSI and suicidality (Berman et al., 2005; Berman & Walley, 2003; McCloskey et al., 2012). Its

discriminant validity has been demonstrated by its lack of associations with desire to win or self-reported anxiety (Berman & Walley, 2003). Its external validity have supported by the SAP's associations with correlates of extra-laboratory self-harm, such as benzodiazepine consumption (Berman et al., 2005) and history of depression (McCloskey et al., 2008). Instructions for the SAP procedure can be found in Appendix A.

The first part of the SAP is a pain tolerance procedure. Fingertip electrodes were attached to the middle and index fingers of the participant's non-dominant hand. Then, the participant was administered shocks of increasing intensity (100-microampere increments). The participant indicated the level at which they considered the shock to be "painful" and said they were unwilling to go higher; this level was recorded as the participant's pain tolerance. For safety, if the participant did not ever indicate a desire to stop the pain tolerance procedure, the examiner stopped the procedure after the 2.50 milliampere shock and recorded that level as the participant's pain tolerance. The participant was then told that the procedure would be repeated for another participant in a different room; this second participant was not real, and their voice was simulated by playing pre-recorded audio of a same-sex actor through an intercom.

The second part of the SAP is the "reaction time task," during which the measurement of a laboratory analogue of DSH is obtained. The participant was told that they would be competing in a reaction time competition against the other "subject" who had just completed the pain tolerance task as described in the above paragraph, and who had consumed the same amount of alcohol as they had. In reality, there was no second "subject," and the task was pre-programmed so that the participant would win 20 trials and lose 20 trials. After the participant "lost" a trial, they were prompted to select a shock level to self-administer. There were 12 shock level options: 0, each integer from 1 to 10, and 20. If the participant chose "0," they would not receive any

shock. The "10" option corresponded to a shock equivalent to 100% of the participant's pain tolerance, "9" corresponded to 95% of the participant's pain tolerance, "8" corresponded to 90% of the participant's pain tolerance, "7" corresponded to 85% of the participant's pain tolerance, and so on, all the way down to the "1" shock. The participant was told that the "20" option was a "severe" shock that would be twice the intensity of the "10" shock, and that the 20 shock could cause "minor tissue damage that will heal quickly." In reality, the 20 shock was the same strength as the 10 shock. The participant was not informed of what shock levels their fictitious opponent chose on any trial.

For the current study, both the mean shock level and the number of "severe" shocks were examined as indices of DSH, because they have both been reported as outcomes in prior SAP studies (e.g., McCloskey et al., 2012; McCloskey & Berman, 2003). These variables represent separate, but related, DSH constructs. The number of severe shocks represents the number of times the participant chose to administer a shock that they believed was above their pain tolerance and that could potentially cause minor tissue damage. In contrast, the mean shock level represents the average severity of self-inflicted pain (even if that pain is below the pain tolerance level) over the course of 20 trials.

Additional Variables

After running the main analyses, additional exploratory analyses were conducted to potentially explain some of the results. Additional measures that were used here included the Deliberate Self-Harm Inventory (DSHI; Gratz, 2001) and the Suicide Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001).

Data Analyses

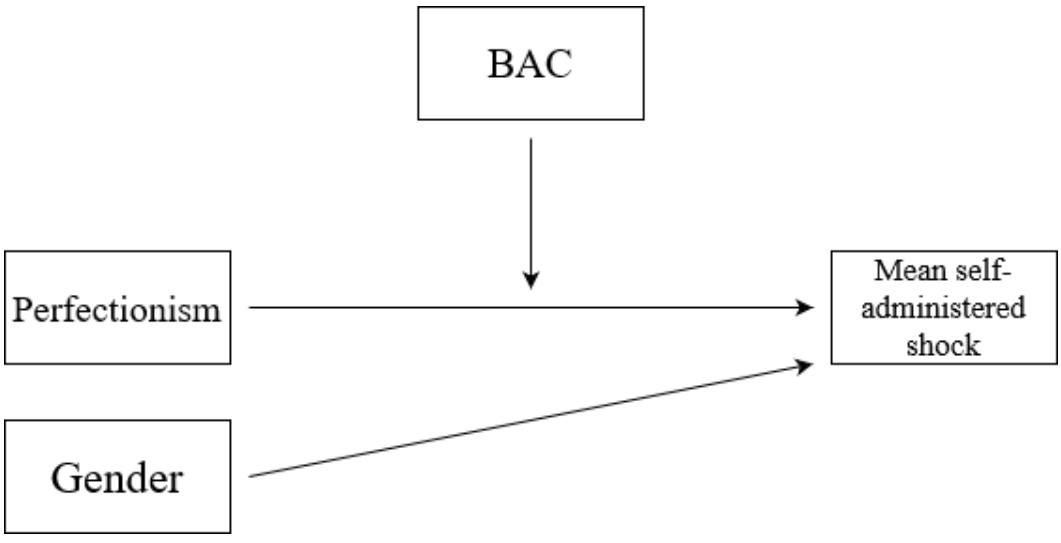
Analytic Plan

For continuous variables, bootstrapping was used to account for non-normality of data when needed. Residual plots were inspected to examine the assumptions of homoscedasticity and independence of errors. Gender was included as a covariate in the models because although the research question does not focus on gender, on average, women set lower shocks on the SAP.

To test the prediction that perfectionism would be positively associated with mean self-administered shock level, a moderated linear regression was conducted with perfectionism as the predictor variable, mean self-administered shock as the outcome variable, BAC as a moderator, and gender as a covariate. Figure 1 illustrates this analysis.

Figure 1

Model of Moderation Analysis Including BAC as a Moderator of the Relationship Between Perfectionism and Mean Self-Administered Shock, With Gender Included as a Covariate.



The distribution of the number of 20 shocks showed a high number of "0" values. Therefore, to test the prediction that perfectionism will be positively associated with the number of self-administered severe shocks, a negative binomial regression, zero-inflated Poisson regression, and zero-inflated negative binomial regression were conducted. In the models, perfectionism was the predictor variable, number of 20 shocks was the outcome variable, BAC was included as a moderator, and gender was included as a covariate. The negative binomial model was run with a log link and a maximum of 100 iterations. The zero-inflated Poisson and zero-inflated negative binomial models were run with a logit link and a maximum of 1000 iterations. The decision for which model to use (negative binomial, zero-inflated Poisson, or zero-inflated negative binomial) was made by examining the models' Akaike Information Criterion (AIC) values, which serve as indicators of model quality.

SPSS version 28 (IBM Corp., 2021) was used to conduct all analyses. The mean shock model was analyzed using Model 1 (a moderated linear regression model) in PROCESS v3.5.3 for SPSS (Hayes, 2017). Zero-inflated models were analyzed using the STATS_ZEROINFL extension (version 1.0.2) included with IBM SPSS Statistics Essentials for R. An alpha of $p < .05$ was used for tests of significance, although interactions were probed if $p < .10$.

CHAPTER III

RESULTS

Descriptive Statistics

Internal Reliability of the SNAP-2 OCPD Scale

Internal reliability of the SNAP-2 OCPD scale was examined for this sample. For the full OCPD scale (25 items), Cronbach's alpha = .64, which may be considered questionable internal reliability. For the perfectionism criterion (3 items), Cronbach's alpha = .52, which is poor. However, this alpha may partially be due to the low number of items on the perfectionism criterion.

Perfectionism

Participants had perfectionism scores ranging from 0 to 3 (M = 1.70, SD = 0.98). Figure B1 (in Appendix B) shows the distribution of perfectionism scores.

Blood Alcohol Content

Participants had BACs ranging from .00 to .15 (M = .06, SD = .04). Out of the 200 participants, 45 (20 women and 25 men) were assigned to the placebo condition, 44 (22 women and 22 men) were assigned to the low dose (.05) condition, 54 (26 women and 28 men) were assigned to the medium dose (.075) condition, and 57 (31 women and 26 men) were assigned to the high dose (.10) condition. Figures B2, B3, B4, and B5 show the distribution of BAC within the total sample and within each non-placebo condition. Within the low dose condition, BACs

ranged from .01 to .07 (*M* = .05, *SD* = .01). Within the medium dose condition, BACs ranged from .04 to .11 (*M* = .07, *SD* = .02). Within the high dose condition, BACs ranged from .03 to .15 (*M* = .10, *SD* = .02).

Mean Shock

Each participant's mean self-delivered shock level was calculated by adding up the shocks selected for each of the 20 "losing" trials, and then dividing this number by 20. In this calculation, the "20" level shock (severe shock) was counted as "11" instead of "20", in order to prevent the mean shock from being unduly influenced by a severe shock. Participants' mean shock level ranged from 0 to 11 (*M* = 4.86, *SD* = 3.84). Figure B6 shows the distribution of mean shock level.

Number of Severe Shocks

Participants' number of "severe" shocks ranged from 0 to 20 (*M* = 2.93, *SD* = 5.92). Out of 200 participants, 139 (69.5%) did not choose to administer any "severe" shocks.

Statistical Assumptions

As described earlier, all assumptions of the relevant statistical tests (e.g., normality of data) were checked before conducting analyses. In almost all cases, the assumptions of the statistical tests were met. There were a few key exceptions. First, a QQ plot revealed issues of normality for the mean shock variable, so bootstrapping with 5000 samples was used to remedy this; in the results of the moderation analyses, *b*, *SE*, and confidence interval (CI) values were bootstrapped. BAC and perfectionism were mean-centered prior to analysis to interpret simple effects should a significant interaction emerge (Hayes, 2017).

Second, for the analyses involving number of severe shocks, when running the zero-inflated Poisson regression, the assumption that the distribution of number of severe shocks follows a Poisson distribution was not checked because it was decided a priori that model fit for zero-inflated Poisson regression, zero-inflated negative binomial regression, and negative binomial regression would be compared after running all three models.

Moderation Regression Model Predicting Mean Shock

The overall model predicting mean shock (controlling for gender) was significant, $F(4, 195) = 9.87$, $p < .001$, $R = .41$, $R^2 = .17$, MSE = 12.52. In this model, BAC was positively associated with mean shock, $b = 20.04$, 95% CI [8.17, 32.02], $SE = 6.13$, $t(195) = 3.07$, $p = .003$. Male gender was associated with higher mean shock, $b = 2.82$, 95% CI [1.81, 3.80], $SE = 0.50$, $t(195) = 5.63$, $p < .001$. Perfectionism was not associated with mean shock, $b = 0.11$, 95% CI [-0.41, 0.61], $SE = 0.26$, $t(195) = 0.43$, $p = .665$. The interaction between BAC and perfectionism was not significant, $b = 0.32$, 95% CI [-12.82, 13.65], $SE = 6.70$, $t(195) = 0.04$, $p = .965$.

Regression Models Predicting Number of Severe Shocks

Three regression models (negative binomial regression, zero-inflated Poisson regression, and zero-inflated negative binomial regression) were analyzed. The model with the lowest AIC was chosen as the final model. Out of the three models (negative binomial AIC = 765.65, zero-inflated Poisson AIC = 785.37, zero-inflated negative binomial AIC = 610.64), the zero-inflated negative binomial had the lowest AIC, so this model was chosen as the final model.

Within the count model (modeling the non-zero values), none of the predictor variables were significant. Within the zero-inflation model (predicting who would have zero severe shocks), gender and BAC were significant. Male gender was associated with greater likelihood

of administering at least one severe shock (b = -2.07, SE = 0.43, z = -4.80, p < .001). Higher BAC was associated with greater likelihood of administering at least one severe shock (b = -32.93, SE = 12.43, z = -2.65, p = .008). Perfectionism was not associated with likelihood of administering at least one severe shock (b = -0.50, SE = 0.45, z = -1.10, p = .270). The interaction between BAC and perfectionism was not significant (b = 5.55, SE = 5.86, z = 0.95, p = .344). These findings mirror the results of the model predicting mean shock. Full results of the count model and zero-inflation model can be found in Table 1.

Table 1

Zero-Inflated Negative Binomial Regression Model of BAC as a Moderator of the Relationship Between Perfectionism and Number of Severe Shocks

	Outcomes							
	Count Model				Zero-Inflation Model			
	b	*SE*	*z*	*p*	*b*	*SE*	*z*	*p*
Intercept	2.70	1.14	2.38	.017	4.17	1.03	4.06	< .001
Gender	0.32	0.34	0.96	.336	-2.07	0.43	-4.80	< .001
BAC	-7.86	12.06	-0.65	.515	-32.93	12.43	-2.65	.008
Perfectionism	-0.40	0.53	-0.76	.450	-0.50	0.45	-1.10	.270
BAC x Perfectionism	3.64	6.09	0.60	.550	5.55	5.86	0.95	.344
Log(theta)	0.06	0.33	0.19	.852				

Note: Gender value of "1" is male; "0" is female.

Additional Analyses

Due to limited evidence for reliability of the perfectionism measure in this sample, and to better understand and provide context for these results in relation to previous literature, I examined self-report measures of self-harm from this same dataset. The perfectionism dimension was not significantly correlated with total score on the Deliberate Self-Harm Inventory (r = -.09, p = .208), number of NSSI incidences reported on the DSHI (r = .04, p = .625), or total score on

the Suicide Behaviors Questionnaire-Revised (r = -.01, p = .892). When examining the full SNAP-2 Obsessive-Compulsive Personality Disorder scale, that was also not significantly correlated with any of those self-harm self-report measures (DSHI total score r = -.05, p = .522; DSHI number of incidences r = -.06, p = .420; SBQ-R total r = -.03, p = .713).

To verify that the SAP variables were good proxies for self-harm, I also ran analyses examining correlations between the SAP variables and self-report measures of self-harm. Each self-report measure was associated with at least one of the SAP variables. Mean shock was positively correlated with DSHI total score (r = .22, p = .002) and number of incidences reported on the DSHI (r = .16, p = .026), but not with SBQ-R total score (r = .07, p = .332). Total severe shocks was positively correlated with DSHI total score (r = .29, p < .001) and SBQ-R total score (r = .17, p = .017), but not with DSHI number of incidences (r = .12, p = .098).

CHAPTER IV

DISCUSSION

The current study found that although male gender and higher BAC were associated with higher mean shock and increased likelihood of self-administering at least one severe shock (as already reported in prior publications about this dataset; Berman et al., 2017), perfectionism was not associated with mean shock level or severe shock administration, and there was no interaction between perfectionism and BAC. This finding contrasts with several previous studies that found different aspects of perfectionism to be associated with DSH (e.g., Arthurs & Tan, 2017; Chang et al., 2019; Luyckx et al., 2015). However, only one of those other studies used a laboratory analogue of self-harm (Chester et al., 2015), and that study did not use a validated measure of self-harm. Therefore, this could suggest that research type (self-reported DSH vs. laboratory analogue of DSH) may play a role in the demonstration of DSH in people who are high in perfectionism. Perhaps an association between perfectionism and DSH is more easily demonstrated by past "real-life" behavior (or one's memory of past behavior) rather than real-time laboratory analogues of DSH. It is also possible that the reaction time task may not have been seen as important enough to apply perfectionistic motivation to. When considering the alcohol myopia model (Giancola et al., 2010; Steele & Josephs, 1990), the SAP task or its resulting cognitions may not have been salient enough to cause intoxicated people who are high in perfectionism to pay more attention to negative perfectionistic thoughts when losing trials.

To better understand and provide context for these results, I also examined self-report measures of self-harm from this same dataset. The perfectionism dimension and the full SNAP-2 OCPD scale were not significantly correlated with any of the self-report measures of self-harm. In addition, each of the self-report self-harm variables were associated with at least one of the SAP variables. Rather than the findings being an issue with laboratory analogues of self-harm, another explanation is that evidence for the SNAP-2 OCPD scale's reliability in this dataset is limited, and, in particular, it may be inappropriate to look at individual OCPD criteria separately.

Notably, in this sample, the full OCPD scale had a Cronbach's alpha of .64, which may be considered questionable internal reliability. For the perfectionism criterion, Cronbach's alpha equaled .52, which is poor. However, this low alpha may partially be due to the low number of items on the perfectionism criterion. It is also unclear why the creators designated the item "Taking care of details is not my strong point" to be a part of the perfectionism criterion rather than the criterion related to preoccupation with details. After looking through documentation describing the SNAP-2's creation and validation, I was unable to find an explanation for how the creators chose each item for each criterion. In addition, SNAP-2 items are answered in a true/false format, which reduces the amount of variability in the data. This lack of nuance may be especially detrimental when considering social desirability bias and the fact that perfectionism (to some degree) may be considered by the general population to be a desirable trait, leading to an improper representation of how "perfectionist" this sample really was. For example, the item "I don't consider a task finished until it's perfect" was endorsed as true by 55.5% of the sample, and 80.5% of the sample responded "false" to "Taking care of details is not my strong point". It is unlikely that these responses represent maladaptive perfectionism for that proportion of the sample, so higher perfectionism scores may not actually represent high (or more maladaptive)

perfectionism. This concern is likely not present for *all* of the SNAP-2 scales, though. For example, the Borderline scale (examining borderline personality disorder traits) mostly consists of socially *undesirable* items that likely would not be endorsed by someone who only slightly identifies with the item (e.g., "I often quarrel with others"). In this sample, the dimensional score for the Borderline scale shows significant positive correlations with DSHI total score ($r = .36$, $p < .001$), DSHI number of incidences ($r = .31$, $p < .001$), and SBQ-R total ($r = .34$, $p < .001$). Analyses from this sample examining the SNAP-2 Borderline scale, BAC, and pain tolerance during the SAP have been conducted and reported previously (Amadi, 2018).

Aside from psychometric issues with the SNAP-2 OCPD scale, it is also possible that an association between perfectionism and DSH may be weak (or non-existent) in the general population. One key point is that although aspects of perfectionism have been associated with NSSI in many studies, there is not an overall agreement about *which* aspects of perfectionism are linked with NSSI, despite the fact that many of those studies used similar measures of perfectionism. This reduces the credibility of an overall link between perfectionism and self-harm. Even if there are certain aspects of perfectionism that really are substantially associated with NSSI, the type of perfectionism specifically measured in the present study (perfectionism interfering with task completion) may not be one of those aspects. Another possibility is that a link between perfectionism and DSH might be more prominent in certain populations. The current study's participants were recruited from the community, and individuals with severe psychopathology were excluded from participation. In contrast, much of the research linking perfectionism to self-harm has been in clinical populations, especially individuals with eating disorders (Claes et al., 2012; Fujimori et al., 2011; Varela-Besteiro et al., 2017). A relationship between perfectionism and self-harm may be present in clinical populations more so than non-

clinical populations, or the relationship may be driven by perfectionism's association with unmeasured variables that are related to self-harm. Aside from clinical samples, most other research on this topic used college student samples (Chang et al., 2019; Chester et al., 2015; Daigle et al., 2018; Flett et al., 2012; Hoff & Muehlenkamp, 2009; Lucas et al., 2019; Yalch & Hopwood, 2016). College students may be an inadequate representation of perfectionism in the general population due to the relatively high level of achievement necessary to attend college (Gallander Wintre et al., 2001; Sears, 1986). In addition, the majority of college student participants fall within a narrow age range (late adolescence and very early adulthood), ages where individuals are often still undergoing substantial identity development. Thus, like clinical populations, college student populations differ from the general population in important ways, and thus findings from those samples may not be good representations of all psychological mechanisms in the general population. Due to these differences, it is possible that perfectionism may be associated with NSSI in college student populations but not in the general population.

Despite the weaknesses of the SNAP-2 OCPD scale, this study benefits from the use of experimental procedures and a laboratory analogue of self-harm. Other strengths of this study include the mixed-gender sample that was drawn from the community, rather than being restricted to undergraduate students or a single gender. Future studies examining similar topics could also benefit from mixed-gender samples drawn from the community, but future research should not use the SNAP-2 when examining perfectionism. Future studies should use better-validated measures of perfectionism with more empirical support, such as the Frost Multidimensional Perfectionism Scale (Frost et al., 1990).

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APPENDIX A

SAP INSTRUCTIONS

THRESHOLD AND TASK INSTRUCTIONS

Chose the male or female folder (depending on the gender of the subject)

Say:

Okay Subject A and B.

"First, I will give you a series of shocks, increasing the intensity with each one. When the shock is first presented, it will be below your threshold and you will not feel it. As the intensity increases, first, you will become aware of it; second, it will feel like a tingling sensation; third, it will feel like a vibration; and finally, the shock will reach an intensity that is definitely painful. I want you to tell me two things: one, report when you first feel the shock, and two, report when you don't want anymore, that is, when it is definitely painful. Okay Subject A, let's start with you. Tell me when you first feel the shock."

Pause threshold WAV file. Determine lower threshold and prepare for upper threshold determination.

Restart WAV file.

"Okay Subject A, now I want you to tell me when the shock becomes definitely painful. By painful I mean that it is so unpleasant that you really couldn't take anymore. Don't say it is painful unless it really is."

Pause WAV file.

Determine upper threshold.

Restart WAV file. immediately

"Okay Subject A, we'll stop there. (Pause 4 seconds). Subject B, your turn. Tell me when you first feel the shock."

10 second delay-voice (male or female) says:

"Okay, yeh, I think I feel it."

5 second delay

"Okay Subject B, same with you-now I want you to tell me when the shock becomes definitely painful. By painful I mean that it is so unpleasant that you really couldn't take anymore. Don't say it is painful unless it really is."

Pause WAV file for the number of seconds to reach the Upper Threshold for subject A. Start WAV file. 5 second delay.

“Whoah!, That’s pretty intense! No more.”

4 second pause “Okay, we’ll stop there B.” 5 second pause.

Task Instructions (also presented before drink administration):

"The purpose of this task is to determine the effect of alcohol consumption and competition on the speed with which a finger can be pulled off a reaction time key. Two of you, situated in separate rooms, will be competing in this task. Both of you have the same apparatus in front of you and the same task to perform. Both of you also received the same amount of alcohol to drink at about the same time.

When you see on the computer screen an instruction to press the space key, you are to depress the space key and hold it down. When the release signal comes on the screen, you are to remove your finger from the space bar as fast as you can. Of course, you both will receive the release signal at the same time. The object of each trial is to get your finger off the space bar as fast as possible in order to beat your competitor. The person who does not get his (her) finger off in the shortest time, that is, the person with the slower reaction time, will select a shock to self-administer. If you win a trial, you will not have the opportunity to select a shock to self-administer. However, a signal will come on telling you that you beat the other person.

There are 12 different intensities of shock you can administer if you have the slower reaction time on a trial. After a losing trial you will see a message on the computer screen asking you to select a shock for yourself. When you see this signal, simply click the mouse on one of the 12 button boxes on the screen. The 1-button corresponds to the least intense shock. The 10-button corresponds to the shock level that you judged painful in the preliminary trials. The 9 shock is 95% of the 10 shock, 8 is 90%, 7 is 85% and so on down to the 1 shock. The 20-button corresponds to a severe shock, about twice the intensity of the shock you judged painful in the preliminary trials. This level of shock may cause minor tissue damage that will heal quickly. The 0-button corresponds to no shock. After you select a shock, you will receive a one second shock of that intensity, unless of course, you select a 0.

To summarize: You will press the space bar down and hold it down when signaled, until the 'release' light flashes. At this time, you are to remove your finger as fast as possible. The slower person on that trial will select a shock to receive. The faster person will not be able to select a shock to receive.

SAP Task Procedure

I. Before the subject arrives

Turn on Coulborne shock equipment from top box to bottom box.

Clean electrode plates gently with just a small amount of alcohol. Let dry.

Set shock to "Manual" and "Subject." Turn current to 0. Place electrodes on finger and have someone increase shock to ensure the equipment is working.

Set the dial back to "Program" (far counter-clockwise) and "Test."

Open the "NIAAA Study" folder

Open "Initialize Shock."

Hit #8, Equipment Test

Hit #5, Shocker Test

Hit CTRL-R

Move shock meter up by hitting + about 10 times. If this works, hit the esc key to exit.

MAKE SURE THE SAP MONITOR IN THE SUBJECT ROOM IS OFF BY MOVING SWITCH TO PC1-THE SWITCH SHOULD BE FLASHING!!

II. Greeting the subject

When the subject arrives, greet them at the door and say in a low voice:

"Other subjects are already here and working on paperwork. We need to speak softly. You'll stay in this room during the day—you'll be Subject A, okay?"

Lead subject to the Subject A room and have them sit on the couch or a chair away from the SAP keyboard. Complete all pre-SAP events in the Running Log.

Make sure that <u>every time</u> you interact with the real subject, you pretend to do the same with a second subject in another room. That is, open the door to another room in the lab (but not the control room), and say the same script as naturally as possible to the pretend second subject. Don't overdo it, or the deception may not be believed!

III. Preparation for the SAP Procedures

Seat the subject in front of the SAP keyboard. Say,

"The purpose of the next task is to see if alcohol consumption affects the speed with which people can pull a finger off a reaction time. You and the other person will compete in this task as

soon as I get both of your ready. Are you right handed or left handed? Okay, I'm going to put the electrode on your non-dominant hand then."

Attach the finger tip electrodes firmly to the index and middle fingers. Say,

"Okay, I want to rest your hand with the electrodes on the table palm up and try not to move. You'll use your other hand to do the reaction time task. Give me a few minutes to hook up the other subject and we'll get started. If you don't mind, I'll give the task instructions to both of you at the same time over the intercom."

Leave the room, and "repeat" for Subject B.

IV. Running the SAP-Thresholds

Load SAP paradigm in using the win or lose file depending on randomization. Enter subject information including handedness. When ready to start the procedure, open the microphone and say:

"Okay Subject A and B. I'm going to open the microphone so we can all hear each other. Okay? We're going to start by calculating discomfort thresholds for both of you. First, I will give you a series of shocks, increasing the intensity with each one. When the shock is first presented, it will be below your threshold and you will not feel it. As the intensity increases, first, you will become aware of it; second, it will feel like a tingling sensation; third, it will feel like a vibration; and finally, the shock will reach an intensity that is painful. I want you to tell me two things: one, report when you first feel the shock, and two, report when you don't want anymore, that is, when it is painful. Let's start the procedure with Subject A in the room closest to the door. Okay Subject A, tell me when you first feel the shock. All you have to say is 'I feel it.'"

Determine lower threshold and prepare for upper threshold determination.

"Okay Subject A, now I want you to tell me when the shock becomes painful. By painful I mean that it is so unpleasant that you really couldn't take anymore. Don't say it is painful unless it really is. Just say 'That's enough' when it is painful"

Determine upper threshold. If subject seems to be stopping short of the threshold, continue to let the computer run for 1 or more trials and say (skip this step if a high threshold is reached that is clearly uncomfortable for the subject):

"Subject A, is it okay if I try just a couple more to make sure that I have it right."

Stop immediately when subject shows some discomfort or declines further shock. <u>Be sure to click to rectangular button that says something like "click before the subject starts pressing the space bar" after the upper threshold – this will record the thresholds</u>.

"Okay Subject A, we'll stop there. (Pause 4 seconds). Subject B, your turn. Tell me when you

first feel the shock."

After a 5 second delay, or equate to approximate delay of responding for Subject A, play the WAV file of the voice (male or female to match Subject A) that says:

“Okay, yeh, I think I feel it.”

Pause (the “ll” symbol) WAV file immediately! After a 5 second delay say:

“Okay Subject B, same with you-now I want you to tell me when the shock becomes definitely painful. By painful I mean that it is so unpleasant that you really couldn’t take anymore. Don’t say it is painful unless it really is.”

Pause WAV file for the number of seconds minus 5 seconds to reach the Upper Threshold for subject A. Start WAV file (has a 5 second delay) that says:

“Whoah!, That’s pretty intense! No more.”

After a 4 second pause, say

“Okay, we’ll stop there B.”

V. Running the SAP (Task Instructions)

"Okay Subject A and B. We’ll do the task now. The purpose of this task is to determine the effect of alcohol consumption on the speed with which a finger can be pulled off a reaction time key—the space bar on the computer. Two of you, situated in separate rooms, will be competing against each other to see who has the fastest reaction time. Both of you have the same apparatus in front of you and the same task to perform. Both of you also received the same amount of alcohol to drink at about the same time.

You will see the instructions “Wait, Get Ready, Hold Spacebar, and Release” on the computer screen. When the computer says to Hold Spacebar, you are to press and hold down the space bar. When the release signal comes on the screen, you are to remove your finger from the space bar as fast as you can. Of course, you both will receive the release signal at the same time. The object of each trial is to get your finger off the space bar as fast as possible in order to beat your competitor. The person who does not get (his/her) finger off in the shortest time, that is, the person with the slower reaction time, will chose the level of shock (he/she) will receive. If you win a trial, you will not have the opportunity to select a shock. However, a signal will come on telling you that you beat the other person, and to wait while they select a shock.
If either of you lift your finger off the space bar before the release signal comes on, a message saying ‘Subject released space bar too soon’ will come on and the two of you will repeat the trial.

There are 12 different intensities of shock you can choose to select if you have the slower reaction time. When you see a message that says you lost and to choose shock, push a number from 1 through 20 or 0 on the top row of the keyboard. The 1-button corresponds to the least intense shock. The 10-button corresponds to the shock level that you judged painful in the preliminary trials. The 9 shock is 95% of the 10 shock, 8 is 90%, 7 is 85% and so on down to the 1 shock. The 20-button corresponds to a severe shock, about twice the intensity of the shock you judged painful in the preliminary trials. This level of shock may cause minor tissue damage that will heal quickly. The 0-button corresponds to no shock. After you select a shock, you will receive a one second shock of that intensity, unless of course, you select a 0.

We'll repeat this process for a number of trials. Neither of you will be informed about the shocks selected by the other person. All you'll know will be whether you won or lost a particular trial.

To summarize: You will press the space bar down and hold it down when signaled, until the 'release' signal flashes. At this time, you are to remove your finger as fast as possible. The slower person on that trial will select a shock to receive. The faster person will not be able to select a shock to receive.

Okay, I am going to turn on the computer monitors for both of you, and we'll start the task. Give me a 'thumbs up' if you can see your monitor"

Turn the monitor to PC2 and start the task.

VI. After the SAP is complete

Turn off the monitor (to PC1) and say:

"Okay Subjects A and B, I'm going to bring in some more questionnaires to complete."

Bring in post task q set and make sure the subject has a pen. Leave electrode on while they complete this and you take the BAC. When complete, remove the electrode and make sure all questions on the form were completed. Continue running log.

VII. Clean up tasks

Copy data from c:/aggression/data/ and place on the main computer—save the file as the subject number.initials. Print out data and place in subject binder.

APPENDIX B

FIGURES OF DESCRIPTIVE ANALYSES

Figure B1

Distribution of Perfectionism Scores (N = 200)

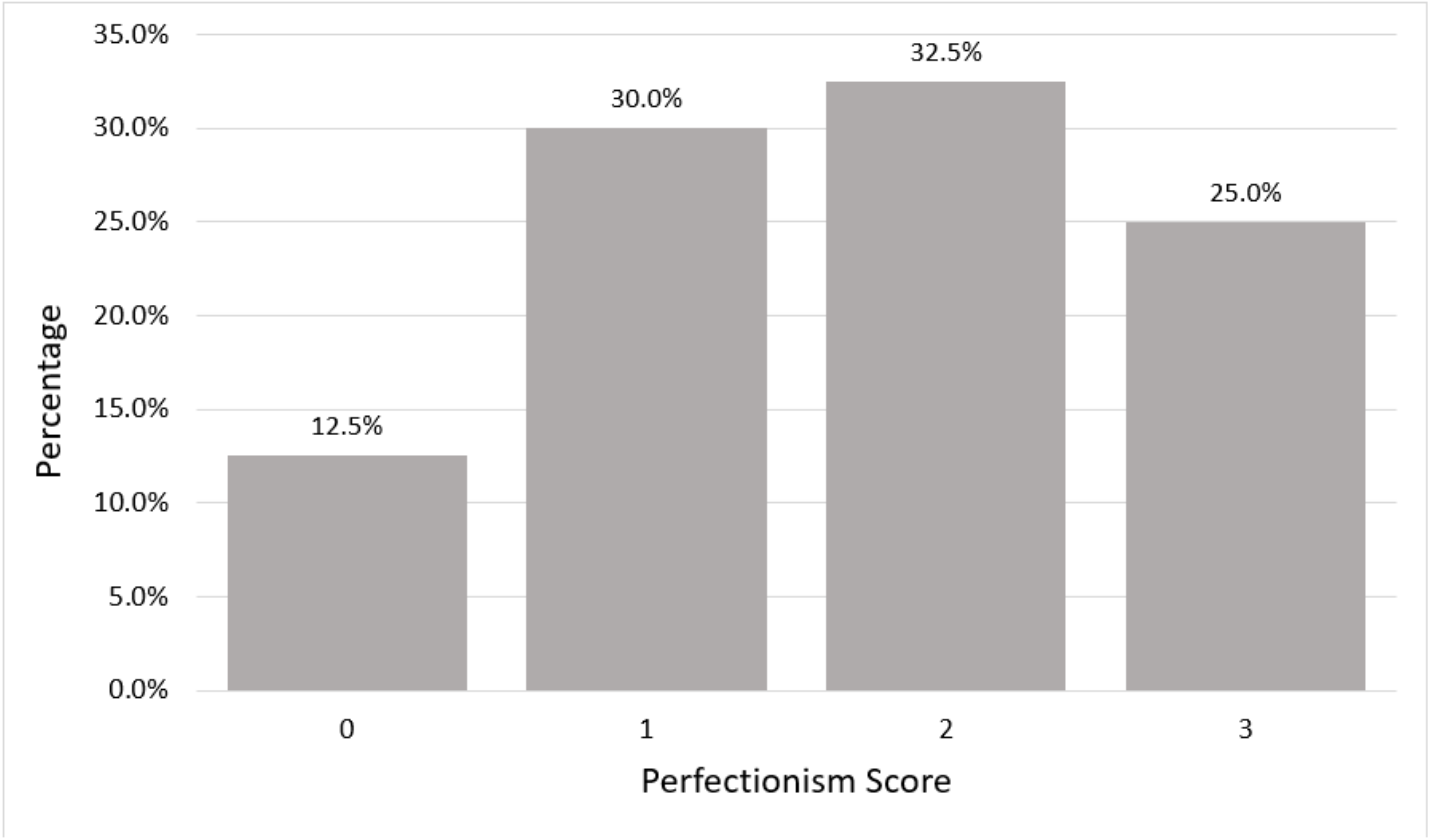


Figure B2

Distribution of Blood Alcohol Content for All Participants (N = 200)

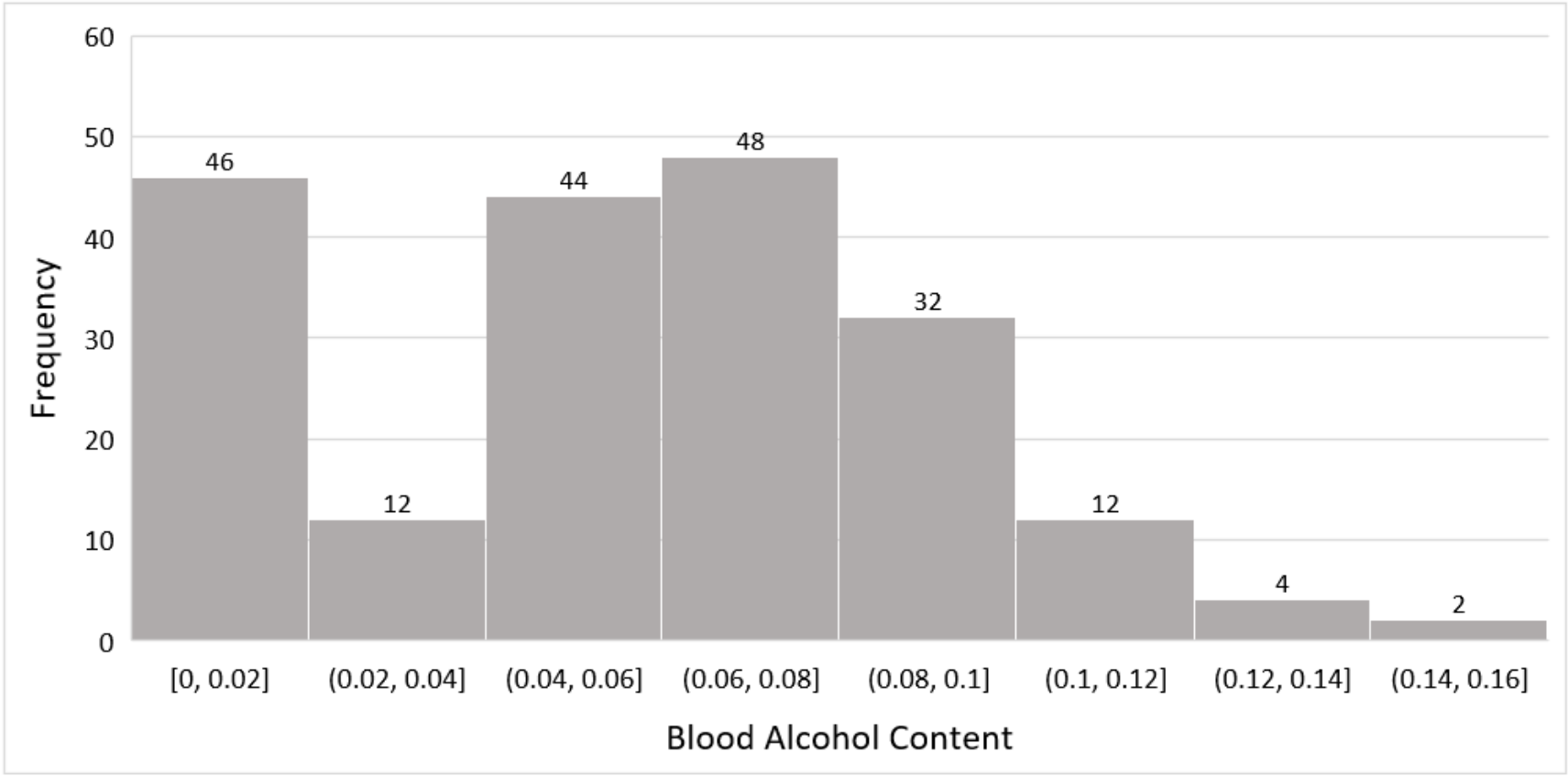


Figure B3

Distribution of Blood Alcohol Content for the Low Dose Group (n = 44)

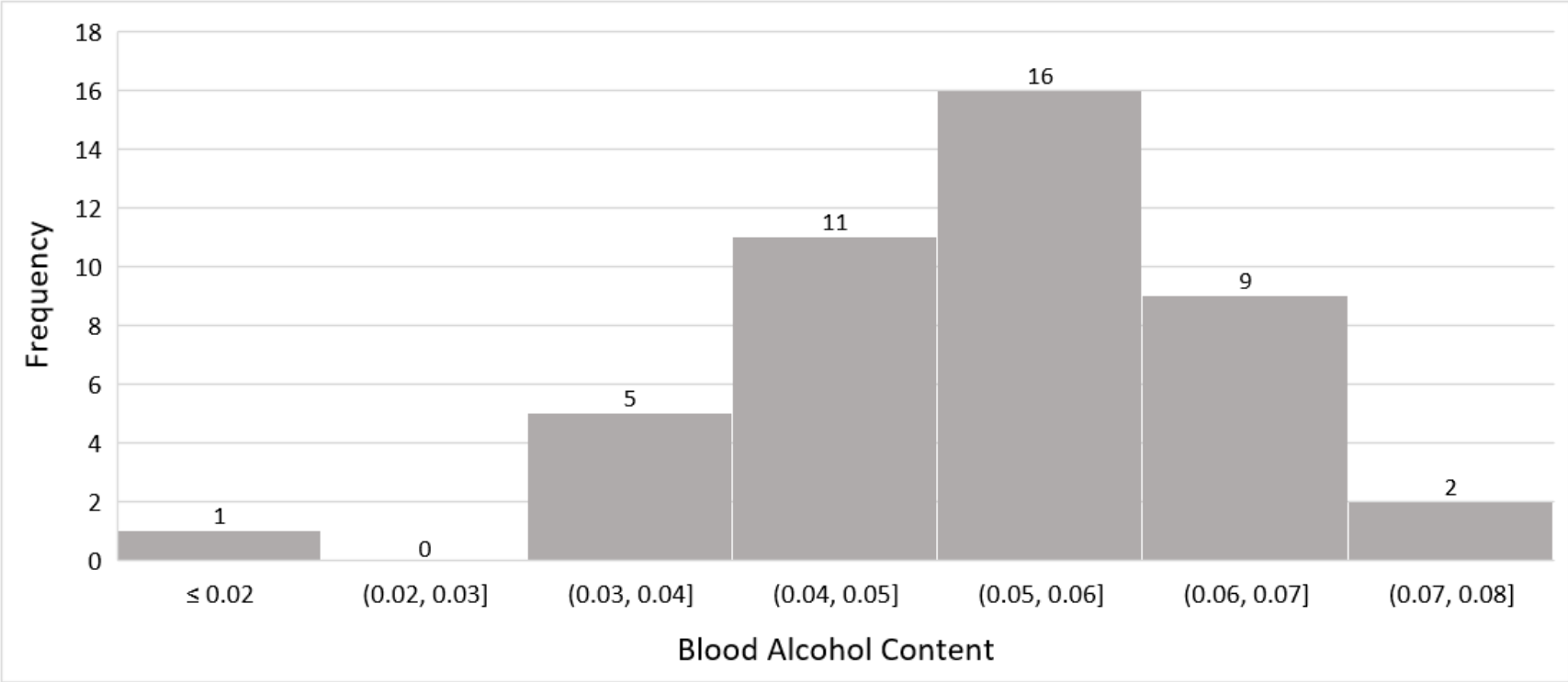


Figure B4

Distribution of Blood Alcohol Content for the Medium Dose Group (n = 54)

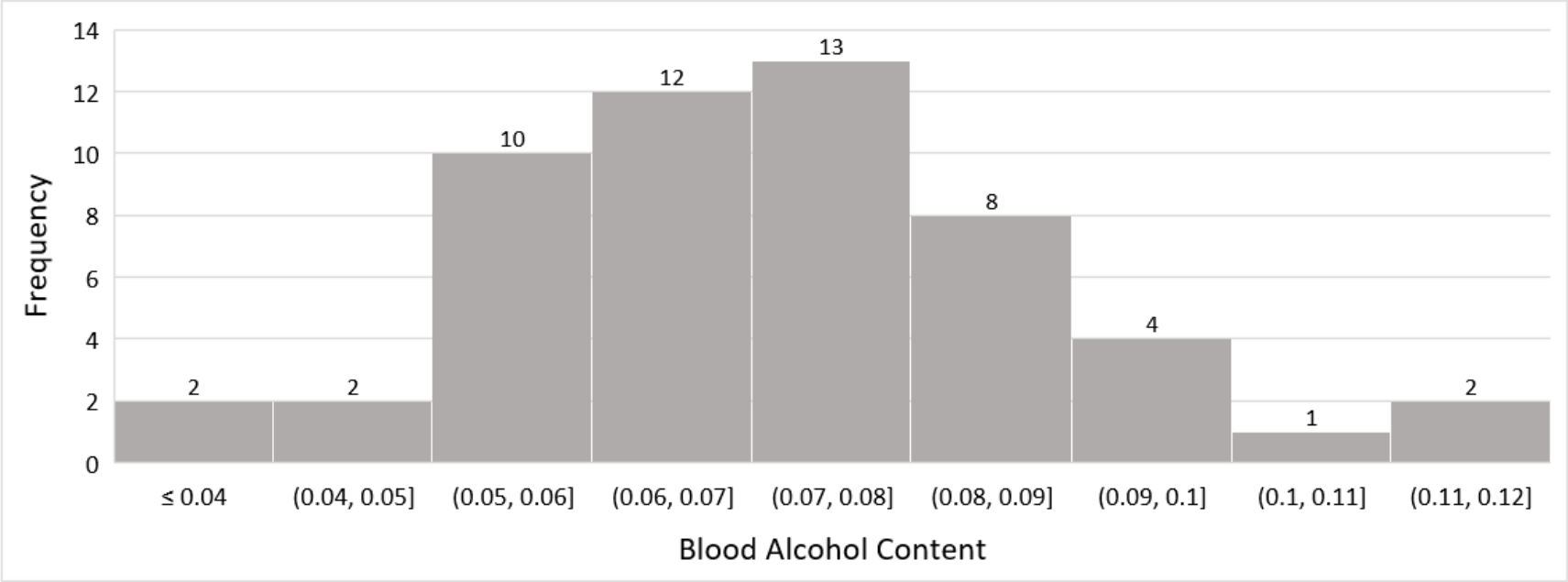


Figure B5

Distribution of Blood Alcohol Content for the High Dose Group (n = 57)

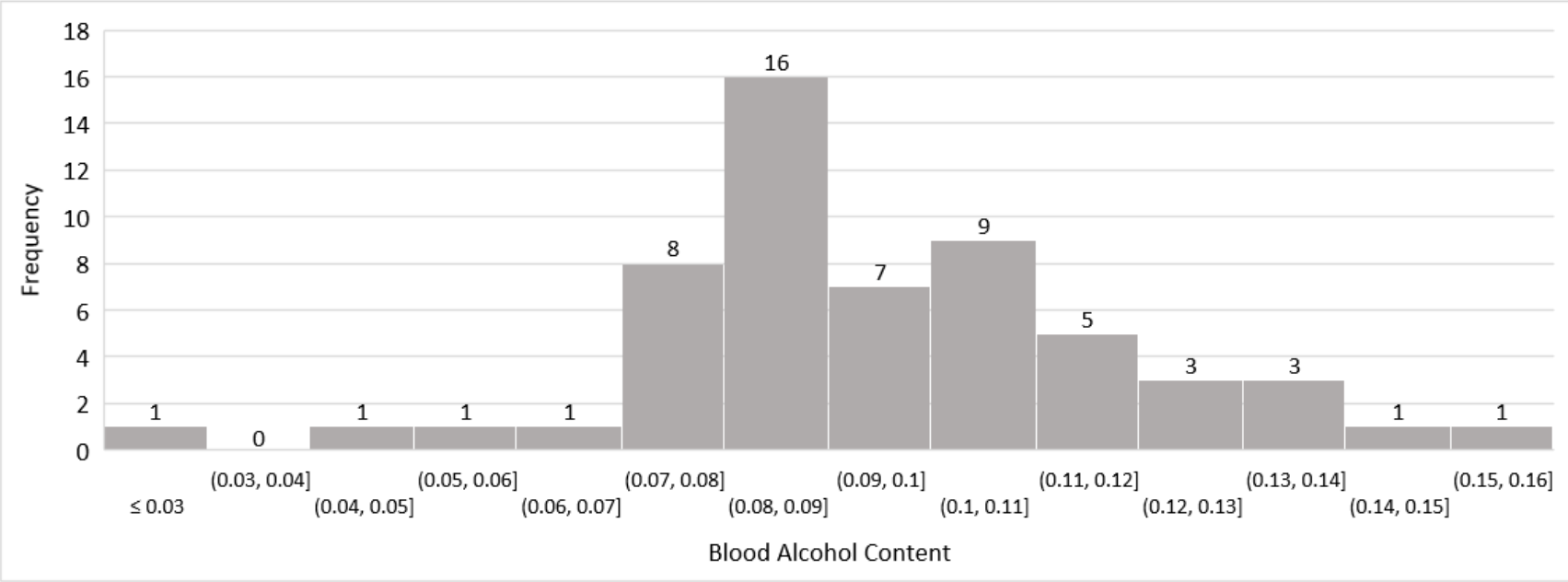
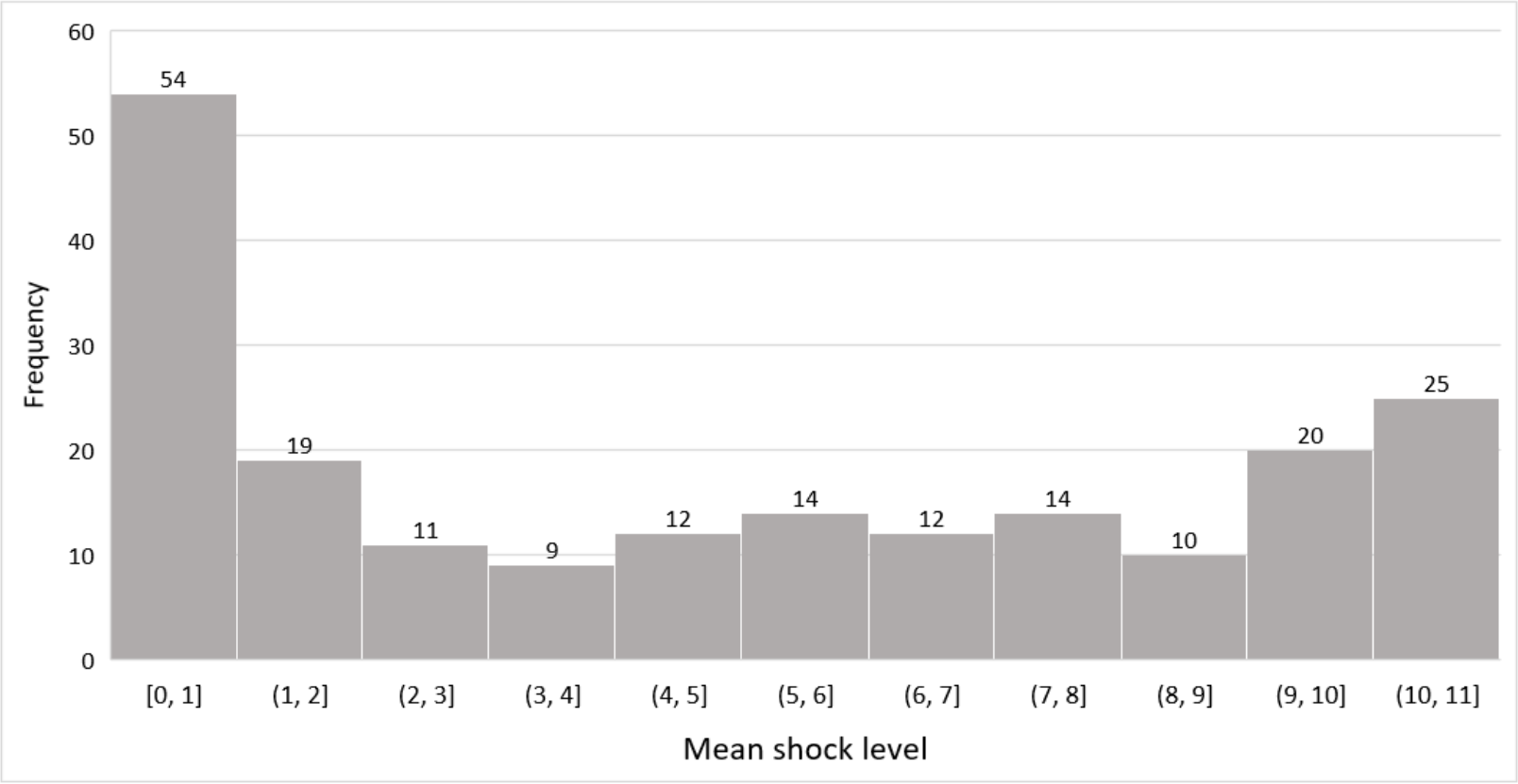


Figure B6

Distribution of Mean Shock Level (N = 200)



APPENDIX C

IRB EXEMPTION LETTER

MISSISSIPPI STATE UNIVERSITY

Office of Research Compliance
Institutional Review Board for the Protection of Human Subjects in Research
P.O. Box 6223
53 Morgan Avenue
Mississippi State, MS 39762
P. 662.325.3294
www.orc.msstate.edu

NOTICE OF DETERMINATION FROM THE HUMAN RESEARCH PROTECTION PROGRAM

DATE:	June 07, 2021
TO:	Mitchell Berman, Psychology, Mary Dozier;Michael Pratte Lissa Mandell, B.S., Psychology, Mary Dozier, PhD, Psychology, Michael Pratte, PhD, Psychology
PROTOCOL TITLE:	The relation between perfectionism and deliberate self-harm in men and women
FUNDING SOURCE:	
PROTOCOL NUMBER:	IRB-21-191
	Approval Date: June 07, 2021 Expiration Date: June 06, 2026

EXEMPTION DETERMINATION

The review of your research study referenced above has been completed. The HRPP had made an Exemption Determination as defined by 45 CFR 46.104(d)4. Based on this determination, and in accordance with Federal Regulations, your research does not require further oversight by the HRPP.

Employing best practices for Exempt studies is strongly encouraged such as adherence to the ethical principles articulated in the Belmont Report, found at www.hhs.gov/ohrp/regulations-and-policy/belmont-report/# as well as the MSU HRPP Operations Manual, found at www.orc.msstate.edu/humansubjects. As part of best practices in research, it is the responsibility of the Principal Investigator to ensure that personnel added after this Exemption Determination notice have completed IRB training prior to their involvement in the research study. Additionally, to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so.

Based on this determination, this study has been inactivated in our system. This means that recruitment, enrollment, data collection, and/or data analysis **CAN** continue, yet personnel and procedural amendments to this study are no longer required. **If at any point, however, the risk to participants increases, you must contact the HRPP immediately. If you are unsure if your proposed change would increase the risk, please call the HRPP office and they can guide you.**

If this research is for a thesis or dissertation, this notification is your official documentation that the HRPP has made this determination.

If you have any questions relating to the protection of human research participants, please contact the HRPP Office at irb@research.msstate.edu. We wish you success in carrying out your research project.

Review Type:	EXEMPT
IRB Number:	IORG0000467