# VALIDATION OF THE MALADAPTIVE BEHAVIOR SCALE IN THREE SAMPLES

By

ASHLEY COLLEEN HELLE

Bachelor of Arts in Psychology
Mount Mercy University
Cedar Rapids, Iowa
2010

Master of Arts in Psychology
University of Northern Iowa
Cedar Falls, Iowa
2012

Master of Science in Psychology
Oklahoma State University
Stillwater, Oklahoma
2014

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF PHILOSOPHY
July, 2018

VALIDATION OF THE MALADAPTIVE BEHAVIOR

SCALE IN THREE SAMPLES

Dissertation Approved:

Stephanie N. Mullins-Sweatt, Ph.D.

Dissertation Adviser

DeMond M. Grant, Ph.D.

Tony T. Wells, Ph.D.

Julie Croff, Ph.D., MPH

# ACKNOWLEDGEMENTS

I would like to express my gratitude to a number of individuals who have contributed to my success across the stages of my dissertation project and graduate training. First and foremost, I am extremely grateful for the immense amount of guidance, support, and wisdom that I have received from my mentor, Dr. Stephanie Mullins-Sweatt. This project and the last five years of projects would not have been possible, and definitely not as rewarding, without her as my mentor. I would also like to acknowledge my committee members, Dr. DeMond Grant, Dr. Tony Wells, and Dr. Julie Croff for their contributions and guidance throughout the development and execution of my project. It has been an honor to have learned from each of you. Next, I would like to acknowledge my labmates, colleagues, and undergraduate research assistants, all of who volunteered their time and energy to assist with field data collection. Not only did they help make this project possible, but also made it a very enjoyable learning experience. I am also appreciative for the funding opportunities and awards that contributed to the success of this project, including the Oklahoma Psychological Association Dissertation Fellowship, Oklahoma State University Robberson Summer Dissertation Fellowship, and Department of Psychology at Oklahoma State University. Last, but certainly not least, I would like to acknowledge my family and friends who have provided support in the long days and helped me celebrate the successes. I am grateful for my parents, Debra and Charles, for building the important foundation of education, perseverance, and independence. Finally, I would like to acknowledge my partner, Craig. I do not know that I will ever be able to adequately express my gratitude for the support he has provided me through all of the seasons of graduate training. I am grateful he chose to join me on this adventure.

Name: ASHLEY COLLEEN HELLE

Date of Degree: JULY, 2018

Title of Study: VALIDATION OF THE MALADAPTIVE BEHAVIOR SCALE IN THREE SAMPLES

Major Field: CLINICAL PSYCHOLOGY

Abstract: Brief and efficient measures of maladaptive behaviors are needed for screening purposes in a variety of health care settings. There currently are no brief broadband measures that assess the frequency of maladaptive behaviors as most of the existing measures assess a narrow set of behaviors, or assess urges, rather than actual behaviors. The current study seeks to revise and validate the Maladaptive Behavior Scale (MBS; DeShong, Helle, & Mullins-Sweatt, in preparation) in three adult samples. Field data collection (community sample) and online recruitment methods (college student sample) were utilized to collect to examine convergent and discriminant validity of the MBS with measures of general and maladaptive personality, personality disorders, impulsivity, and general functioning. The MBS was revised and administered to an online (Amazon Mturk) sample. The revised scale demonstrated excellent internal consistency and convergence with self-report measures of behavioral outcomes, general personality, and impulsivity. The MBS may be considered for use in health care or treatment settings to screen for and identify at-risk behaviors associated with psychopathology and health outcomes.

TABLE OF CONTENTS

Chapter Page

LIST OF TABLES

# CHAPTER I

## INTRODUCTION

Within the fields of clinical, health, and personality psychology, maladaptive behaviors are prevalent. Maladaptive or problematic behaviors may include binge drinking, drug use, risky sexual behavior, nonsuicidal self-injury (e.g., cutting), impulsive spending/gambling, stealing, reassurance seeking, binging and purging. These behaviors may cause difficulties or impairment, yet they also often serve a purpose or function, such as relieving negative affect (e.g., Selby & Joiner, 2009). Thus, changing these behaviors may be difficult, despite the associated negative consequences.

There are many psychiatric conditions associated with maladaptive behaviors and negative outcomes, though engaging in such behaviors are not always indicative of a psychiatric diagnosis. For example, nonsuicidal self-injury (NSSI) is a criterion of borderline personality disorder (BPD), although not all who engage in NSSI have a diagnosis of BPD. However, these behaviors may still cause significant impairment and health consequences. With the possibility of these behaviors occurring outside of a diagnosis and the significant impairment they may cause, maladaptive behaviors are important for physicians, psychologists, counselors, and health educators to consider and assess. Screening for and identifying maladaptive behaviors is important across many contexts (e.g., university counseling centers, primary care providers).

However, there currently is not a brief and efficient measure of maladaptive behaviors to serve this purpose. Identification of these behaviors may lead to referrals for further assessment or intervention, and may alert the provider to the potential presence of other pathology. Furthermore, the presence of maladaptive behaviors outside of pathology may still warrant treatment to implement behavior change if the behaviors are problematic. Therefore, there is a critical need for such a measure.

There are a wide variety of measures in the field to assess maladaptive behaviors; however, most scales focus on one specific area or behavior. For example, there are narrowband measures of maladaptive drinking (e.g., AUDIT; Saunders, Aasland, & Babor, 1993), sexual risk-taking (Self-Assessment: Student Sexual Risks Scale; DeHart & Birkimer, 1997), and eating disorders (SCOFF; Morgan, Reid, & Lacey, 2000). However, assessing a variety of maladaptive behaviors associated with pathology would result in a large number of measures completed by each patient. This is not feasible in most health and psychiatric care settings due to time constraints and high workload.

There are also measures that assess impulsive behaviors, which are relevant as most maladaptive behaviors are associated with impulsivity, and/or impulsiveness under conditions of negative affect. The Impulsive Behavior Scale (IBS; Rosotto, Yager, & Rorty, 1998) is a 25-item scale that assesses impulsive behaviors, such as nonsuicidal self-injury, theft, substance use, risky sex, and taking-risks with exciting activities. This scale assesses the frequency of these behaviors over the individual's lifetime. Specifically, one may respond that that he/she has engaged in an activity on the following scale: never, once, on occasion (2-3 times), sometimes (4-20 times), regularly (+20 times). While this scale is an optimal length for a screening questionnaire, the scale used for frequency of behaviors may not be

ideal for providers in terms of specificity. If a patient selected “sometimes (4-20 times)” for a behavior, it could indicate that they engaged in that behavior 10 years ago on four different occasions, or that they engaged in that behavior 20 times within the last month. Additionally, there are other relevant and important behaviors not assessed in the IBS, such as gambling and aggressive behaviors.

The Risky Behavior Scale (Fischer & Smith, 2004) was developed to assess a range of risk-taking activities for a research study that sought to examine the effects of impulsivity on risk taking behaviors. The Risky Behavior Scale includes 97-items assessing risky behaviors in sports, financial decisions, substance use, and criminal decisions. This scale has a maladaptive risk-taking component; however, it is longer than is ideal for a screening measure, and includes behaviors that are not necessarily relevant for the purpose of a measure of behaviors associated with emotion dysregulation (e.g., snow skiing). Further, this scale does not include key behaviors relevant to emotional dysregulation and borderline personality traits (e.g., nonsuicidal self-harm, binging and purging).

The Composite Measure of Problematic Behaviors (CMPB; Kingston et al., 2011) is a fairly comprehensive measure of maladaptive behaviors. This scale assesses many problematic behaviors (e.g., nicotine use, alcohol use, deliberate self-harm, excessive computer game use, restrictive eating) and includes 46 items. While the scale assesses an adequate range of behaviors, the measure does not strictly assess engagement in behaviors. Specifically, the CMPB assesses the intention or desire to engage in behaviors (e.g., “feel the urge to intentionally harm myself” or “feel irritation if I am in a non-smoking environment”). The intention or urge to engage in a behavior is separate from the action, both of which are relevant. However, efficiency and strict behavioral measures may be more beneficial across

settings for screening, whereas more detailed measures can be administered at follow up referral appointments. Thus, measures of strictly problematic behaviors that are often associated with psychopathology are needed in the field. Further, providers would greatly benefit from measures that include a range of behaviors and frequency within a recent period of time, as this may assist the provider in assessing risk and providing applicable referrals at that time.

To meet the need for a brief and efficient measure of engagement in maladaptive behaviors, the Maladaptive Behavior Scale (MBS; DeShong, Helle, & Mullins-Sweatt, in preparation) was developed. The MBS is a 33-item measure of the following behaviors: alcohol and drug use, risky sexual behavior, nonsuicidal self-injury and suicide gestures/attempts, maladaptive eating behaviors (e.g., binging, purging, restricting), theft, reckless driving, impulsive spending and gambling, verbal and physical aggression, and reassurance seeking. The frequency of each behavior over the last month is assessed with the MBS. This scale was originally developed with the purpose of identifying and measuring problematic behaviors associated with borderline personality traits. Validation in more diverse, nonconvenience samples is necessary before the MBS can be disseminated for use as a screening measure in health care settings or in research studies as an outcome measure.

The purpose of the current study was to validate the MBS across three samples, including a community sample, college student sample, and Amazon MTurk sample. Psychometric properties of the MBS (e.g., internal consistency), in addition to convergent and discriminant validity with other measures were examined. Specifically, convergent validity of the MBS with narrowband measures of specific behaviors, general personality traits, psychopathology (i.e., personality disorder symptoms), and the UPPS-P

multidimensional model of impulsivity were included. This is consistent with the literature, as maladaptive behaviors have been examined primarily in relation to these variables. There have been studies examining specific types of maladaptive behaviors (e.g., substance use, sexual risk taking) in relation to general and maladaptive personality traits, as well as impulsivity using the UPPS-P facets (negative urgency, positive urgency, lack of perseverance, lack of premeditation, sensation seeking; Whiteside & Lynam, 2001). For example, problematic substance use is often associated with high neuroticism, low agreeableness and conscientiousness (Flory, Lynam, Milich, Leukefeld, & Clayton, 2002), as well as negative urgency—a facet of impulsivity characterized by acting impulsive under conditions of negative affect (Dir, Karyadi, & Cyders, 2013). Sexual risk taking is associated with high extraversion, and low agreeableness and conscientiousness (Hoyle, Fejfar, & Miller, 2000), as well as sensation seeking, positive urgency, and negative urgency (Deckman & DeWall, 2011). Overall, high neuroticism and extraversion, and low agreeableness and conscientiousness tend to be associated with a number of maladaptive behaviors. Within the UPPS-P model of impulsivity, all five facets have been associated with maladaptive behaviors, with negative and positive urgency specifically demonstrating the strongest relationship with psychopathology (Berg, Latzman, Bliwise, & Lilienfeld, 2015).

Additionally, problematic behaviors are often associated with negative outcomes, such as health difficulties and problems with interpersonal functioning. Measures of psychological well-being, health, and personality disorders were included to further validate the scale. The current study relied on the empirical literature to guide the examination of convergent and discriminant relationships, such that previous research has indicated maladaptive behaviors are associated with impaired functioning and negative outcomes (e.g.,

Jennison, 2004) and personality disorder symptoms (e.g., Bornstein, 2001; Oldham, 2006; Skodol, Oldham, & Gallaher, 1999). Additionally, the current study implemented internal validity procedures (i.e., internal consistency) and factor analytic procedures to refine the scale.

## The Current Study

The Maladaptive Behavior Scale was originally developed for utilization with individuals who have borderline personality traits. The current study seeks to extend the validation sample to include those who are not necessarily at risk or meet criteria for BPD, but to assess maladaptive behaviors that are associated with negative affect. This project sought to validate and refine the scale in three samples: a sample of adults representative of the community (sample 1); a college student sample of young adults (sample 2), and a United States-wide sample of adults using Amazon's Mechanical Turk (sample 3).

The current examined the convergent validity of the MBS with other measures of impulsivity, general personality traits, personality disorders, and narrowband measures of problematic behaviors in two samples. Specifically, the associations of the MBS with the Five-Factor Model, DSM-5 categorical personality disorders, narrowband behavioral measures of maladaptive behaviors, and SUPPS-P/UPPS-P Impulsivity facets were examined. Finally, with the analyses listed above and other statistical procedures (internal consistency, factor analytic procedures), the MBS was revised as part of the current study and validated in a third sample. Specifically, the following hypotheses were tested:

(1a) The Maladaptive Behavior Scale total score will be positively correlated with the neuroticism domain and neuroticism facets. (1b) The MBS total score will be positively correlated with the extraversion domain and excitement-seeking facet. (1c) The MBS total

score will be negatively correlated with the agreeableness domain and six facets. (1d) The MBS total score will be negatively correlated with the conscientiousness domain and six facets. This will be measured with the FFMRF in sample 1 and the IPIP NEO 120 in samples 2 and 3.

(2) The MBS total score is expected to relate to the following SUPPS-P (sample 1)/UPPS-P (samples 2 and 3) impulsivity facets: positively related to negative urgency, positive urgency, (lack of) premeditation, (lack of) perseverance, and sensation seeking.

(3) It is hypothesized that each behavior will be positively correlated with the respective self-report narrowband behavioral measures. For example, the alcohol-related items on the MBS will be significantly related to the AUDIT total score.

# CHAPTER II

# METHODOLOGY: SAMPLES 1 AND 2

## Sample 1

### Participants

Two hundred and fifteen individuals (across 138 clusters) participated in the study across nine data collection events. Each participant first answered three eligibility questions, including age (18 years or older), fluency in English, and sobriety at the time of the study. The eligibility questions ruled out 11 participants (5 indicated age < 18 years, 5 indicated they were currently under the influence; and 1 failed all three eligibility items). After eligibility was established, consent was reviewed and participants learned more about the study. At that time, 2 participants declined to participate. Therefore, 202 participants completed the study.

The mean age of participants was 33.27 years (*SD* = 12.99), and ranged from 18 to 71. Four participants declined to report age. Approximately half (*n* = 107; 53%) of participants identified as female, 45.5% (*n* = 92) identified as male, and 3 declined to report gender. Ethnicity was reported as follows: 67.8% Caucasian (*n* = 137), 8.9% African American (*n* = 19), 6.9% American Indian (*n* = 14), 5.4% Asian (*n* = 11), 5.0% biracial or multiracial (*n* = 10), 3.5% Hispanic/Latino (*n* = 7), 1.5% Other (*n* = 3), and 1% declined to report ethnicity (*n* =2).

Participants also reported on their legal and treatment history. Results indicated 27.7% of participants ($n$ = 53) have a history of, or currently were seeking psychological treatment. Eleven participants declined to report treatment history. Of participants that answered a question regarding legal history ($n$ = 195), 63 (31% of sample) reported having one or more type of offense in the past (driving violations, physical assault, theft, alcohol or drug related offenses).

**Measures**

Cronbach's alpha for all measures used in Sample 1 are presented in Tables 1, 3, and 9.

*Demographic Questionnaire.* Routine demographic information was collected from the participants, as reported above.

*Maladaptive Behavior Scale* (MBS). The MBS is a 33-item measure designed to assess maladaptive behaviors associated with impulsivity and emotion dysregulation. The MBS assesses the following behaviors: substance use, risky sexual behavior, self-harm and suicidal behavior, binging, purging, and restricting food intake, theft, reckless driving, gambling, physical and verbal aggression, and reassurance seeking. Due to the desire to emphasize impulsive behaviors, the reassurance seeking items (original MBS items 30-33) were not included in the MBS analyses. The 29-item version of the MBS was utilized for the current study. As it was not intended for these items to be included in the revised MBS, they were not included the following analyses. The MBS was designed to assess the frequency of the behaviors within the last month and each item is rated on a five-point Likert scale ranging from 0 (never/not at all) to 4 (every day or nearly every day). The original version of the scale was administered to the community sample.

Cronbach's alpha for the total scale was 0.75 and ranged from .29 (binging/purging and impulsive driving) to 0.67 (impulsive spending). See Table 1 for the full range of Cronbach's alpha. The reliability analyses for the MBS are discussed further in the results section.

*Five Factor Model Rating Form* (FFMRF; Mullins-Sweatt, Jamerson, Samuel, Olson, & Widiger, 2006). The FFMRF is a 30-item measure that assesses the 30 facets of the FFM. Each facet is assessed via two bipolar descriptors with a five-point rating scale. For example, the neuroticism facet of anxiousness gives the anchors of "fearful, apprehensive" (5), and "relaxed, unconcerned, cool" (1), with three additional rating points in between (2-4). The Cronbach's alpha of each domain in the community sample were acceptable ($\alpha = 0.76$) to good ($\alpha = 0.84$) for the five domains (domain-level Cronbach's alpha are presented in Table 3).

*Personality Disorder Rating Form*. This rating form has one item to represent each of the ten DSM-5 categorical personality disorders. Participants rated each personality disorder statement (e.g., "I am submissive and dependent on others") on a five-point Likert scale ranging from 1 (never) to 5 (always).

*Short UPPS-P Impulsive Behavior Scale* (SUPPS-P; Lynam, 2013; Cyders et al., 2014). The SUPPS-P is a 20-item measure of five facets of impulsivity: Negative Urgency, Positive Urgency, (Lack of) Perseverance, (Lack of) Premeditation, and Sensation Seeking. Each facet has four questions, and all questions are rated on a four-point Likert scale ranging from 1 (agree strongly) to 4 (disagree strongly). Cronbach's alpha for each scale in the community sample ranged from 0.62 (Lack of Perseverance) to 0.79 (Negative Urgency).

*Schwartz Outcome Scale-10* (SOS-10; Blais et al., 1999). The SOS-10 is a measure of psychological wellbeing and health. This measure assesses areas including life satisfaction, interpersonal effectiveness, optimism, positive self-appraisal, and the absence of psychological symptoms with ten items. Each item was rated on a seven-point Likert scale ranging from 0 (never) to 6 (all or nearly all of the time). Participants were asked to rate how the item fits with their experience over the last seven days. The SOS-10 had excellent internal consistency in the community sample.

**Procedure**

Nine separate data collection events were completed and sites included bars, restaurants, community events, and gas stations. A systematic random sampling protocol was utilized to protect against selection bias and ensure that the sample is representative of patrons at each business/location. There was a predetermined start time and systematic sampling began thereafter. The sampling procedure identified clusters (defined as any "group" of people with one or more individuals) of people to recruit using a random number generator to determine the sampling cluster number between 1 and 6 for each data collection event.

After a cluster was identified, the researchers approached the cluster of individual(s) with a verbal invitation to participate with a brief description of the study. If the individuals within the clusters were interested, they completed a three-item eligibility questionnaire prior to continuing the study. Eligibility included age (18 years or older), fluent in English, and sober at the time of the survey. Following the informed consent process, participants completed the survey on iPad tablet device or paper packet.

Following participation, participants selected a $5 gift card for an area business (e.g., Wal-Mart, Starbucks) as compensation for their participation in the study.

## Sample 2

### Participants

Participants were recruited from the SONA research participant pool system at Oklahoma State University. Eligibility requirements included age (18 years of age or older), fluent in English, and enrollment in the SONA research participation system. A total of 385 participants completed the study. An additional 40 participated but were removed for partial completion ($n$ = 9), completing the survey invalidly according to the EPA infrequency ($n$ = 4) or EPA virtue ($n$ = 26) scales, or not being eligible (under 18 years of age; $n$ = 1). The average age of participants was 19.71 years ($SD$ = 2.96, range = 18-52 years). Participants were 66.2% female ($n$ = 255), 33.5% male ($n$ = 129), and 0.3% another option ($n$ = 1). Participants reported their ethnicity as follows: 82.6% Caucasian, 9.1% American Indian/Alaska Native, 7.0% African American, 5.2% Hispanic/Latino, 2.3% Asian, 2.1% as Other, and 0.5% declined to respond (percentages sum to > 100% as participants could select more than one ethnicity; 4.4% identified with more than one category). Psychiatric treatment history was assessed and participants reported if they were in treatment at the time of the survey (3.4%), in treatment within the last year (5.5%), in treatment more than one year ago (16.1%), or had no history of treatment (73.5%). An additional 1.6% of participants declined to provide information regarding treatment history. Participants were also asked about history of legal issues and 31 (12.7%) participants reported legal troubles in one or more of the following areas: driving

violations (9.4%), alcohol (2.6%), drugs (1.6%), theft (0.3%), sexual assault (0.3%), and physical assault (0.3%).

**Measures**

Cronbach's alpha for all measures used in Sample 2 are presented in Tables 1, 3, 5, and 9.

*Demographic Questionnaire*. Routine demographic information was collected from the participants, as reported above.

*Maladaptive Behavior Scale* (MBS). The original version of the scale was administered to the student sample. Cronbach's alpha for the total scale and subscales are presented in Table 1. The total scale Cronbach's alpha was 0.80 and content areas ranged from .18 (impulsive spending) to .90 (self-harm/suicide).

**Personality Measures**

*Item Response Theory-Driven (IRT) Short Form IPIP-120* (Maples, Guan, Carter, & Miller, 2014). The IPIP-120 is a self-report measure of the FFM personality traits developed based on the original 300-item IPIP NEO (open access version of the NEO). The IPIP-120 assesses five domains and 30 facets of the FFM. Each IPIP-120 item is rated on a 5-point Likert scale ranging from 1 (disagree strongly) to 5 (strongly agree). The IPIP-120 has demonstrated convergence with the NEO PI-R and other versions of the IPIP-NEO, as well as adequate reliability and validity. Internal consistency of the domains ranged from acceptable (Openness to Experience) to good (Conscientiousness). Cronbach's alpha for the facet subscales also ranged from acceptable (0.62; Self-consciousness) to good (0.85; Gregariousness).

*Personality Diagnostic Questionnaire—4* (PDQ-4; Bagby & Farvolden, 2004). The PDQ-4 is a commonly used self-report measure of personality disorder symptomology. The PDQ-4 has 99-item true/false measure that assesses symptoms of DSM-5 categorical personality disorders. The internal consistency for the total score in the student sample was excellent (0.94), and subscales ranged from 0.54 (Histrionic) to 0.73 (Dependent).

*UPPS-P Impulsive Behavior Scale* (UPPS-P; Lynam, Smith, Whiteside, & Cyders, 2006): The UPPS-P is a 59-item self-report measure of five facets of impulsivity: negative urgency, positive urgency, lack of premeditation, lack of perseverance, and sensation seeking. Each item is rated on a 4-point Likert scale ranging from 1 (agree strongly) to 4 (disagree strongly). Internal consistency of the subscales ranged from good to excellent in the student sample (see Table 3).

**Behavioral Measures**

*Alcohol Use Disorders Identification Test* (AUDIT; Saunders et al., 1993). The AUDIT is a 10-item self-report screening measure of alcohol use disorders. The measure assesses three broad domains, including alcohol intake, dependence, and negative consequences. Each item is rated on a Likert scale to assess the frequency of the behavior or number of drinks. The AUDIT is acceptable for use in young adults (e.g., college students) and non-college adult samples. Cronbach's alpha in the student sample was acceptable.

*Cannabis Use Disorders Identification Test- Revised* (CUDIT-R; Adamson et al., 2010). The CUDIT-R is an 8-item self-report screening measure of cannabis use disorders. The measure assesses three areas of problematic cannabis use, including:

abuse, dependence, and psychological features. Each item is rated on a Likert scale, assessing the frequency of behavior (e.g., days, weeks) or number of hours engaged in the behavior. Cronbach's alpha in the student sample was good.

*Drug Use Disorders Identification Test* (DUDIT; Berman, Bergman, Palmstierna, & Schlyter, 2005). The DUDIT is an 11-item screening tool for drug use disorders. This self-report measure assesses the frequency and quantity of use, tolerance, urges, and impairment associated with drug use (not including alcohol). Drugs within the following categories are included on the assessment: cannabis, amphetamines, cocaine, opiates, hallucinogens, solvents/inhalants, GHB, and misuse of prescription drugs (e.g., sedatives, painkillers). Cronbach's alpha in the student sample was good.

*Sexual Impulsivity Items* (Miller et al., 2004). The items assessing sexual risk taking included seven questions from the following content areas: number of sexual partners by age 20, use of alcohol or drugs before or during sex, number of occasions of sexual intercourse without a condom in the past 3 months, early childbearing evidenced by giving birth during high school years, sex outside of one's primary relationships, and early sexual debut. A total "risk" score was calculated using a sum score of risk indicators including: having 3 or more sexual partners by age 20, using substances during sex, had unsafe sex (e.g., without a condom), giving birth before age 18, having sex with someone other than primary partner, and having sexual intercourse prior to age 14 years. This summed risk score was utilized in the analyses.

*Inventory of Statements about Self-Injury* (ISAS; Klonsky & Glenn, 2009). The ISAS is a 46-item self-report measure of self-injurious behaviors. The scale assesses frequency and severity of self-injurious behaviors as well as functions of self-injury with

39 questions ranging from 0 (not relevant) to 2 (very relevant). The functions comprise two overall subscales of Interpersonal Functions ($\alpha = 0.92$) and Intrapersonal ($\alpha = 0.94$) functions.

*Suicidal Behaviors Questionnaire-Revised* (SBQ-R; Osman et al., 2001): The SBQ-R is a 4-item self-report measure of suicidal behaviors that assesses four constructs: lifetime suicide ideation/attempt, frequency of suicidal ideation in last 12 months, threat of suicidal behavior, and likelihood of suicidal behavior. The SBQ-R total score has demonstrated acceptable reliability for use in adolescent and adult samples, and clinical and non-clinical settings (Osman et al., 2001). The internal consistency of the SBQ-R items in the current study was good.

*Eating Disorder Examination Questionnaire 6.0* (EDE-Q 6.0; Fairburn & Beglin, 1994; Fairburn & Beglin, 2008). The EDE-Q 6.0 is a 28-item self-report questionnaire based on the EDE Interview measure (Fairburn & Cooper, 1993). The scale has a global score and three subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern. The EDE-Q has demonstrated adequate psychometric properties as a self-report screening measure for eating disorders (Luce & Crowther, 1999). Cronbach's alpha of the relevant scales in the current study (EDE-Q Restraint and Global scores) were good and excellent, respectively.

*Dula Dangerous Driving Index* (3DI; Dula & Ballard, 2003). The 3DI assesses aggressive/dangerous driving in three content areas: risky driving, negative cognitive/emotional driving, and aggressive driving. The self-report measure has 31 items, all rated on a 5-point Likert scale ranging from (A) never to (E) always. The total score and negative cognitive/emotional driving subscales were used to examine

convergence with MBS items in the current study. The total score and negative emotions subscale had excellent and good internal consistency, respectively.

*Kleptomania Symptom Assessment Scale* (K-SAS; Grant & Kim, 2002). The K-SAS is an 11-item self-report measure that assesses the urges and thoughts related to stealing, frequency of actual behaviors within the last 7 days, and emotions (e.g., excitement, distress) associated with stealing behavior. Items are rated on dimensional scales. The scale demonstrated excellent internal consistency, good convergent validity, and fair test-retest reliability over a one-week period in previous research. Cronbach's alpha of the total KSAS score was good in the student sample.

*Richmond Compulsive Buying Scale* (Ridgway, Kukar-Kenny, & Monroe, 2008). This scale assesses compulsive buying with a focus on buying behaviors (spending money), rather than shopping without spending money. There are 6 questions with four rated on a 7-point Likert scale ranging from strongly disagree to strongly agree, and two rated on a 7-point Likert scale ranging from never to very often. The student sample had good internal consistency.

*South Oaks Gambling Screen-Revised* (SOGS; Lesieur & Blume, 1993). The SOGS is a 16-item screening measure of problematic gambling behaviors that can be utilized in general adult samples or clinical adult samples. The SOGS total score demonstrated good internal consistency in the student sample.

*Reactive-Proactive Aggression Questionnaire-Adult* (RPQ-A; Raine et al., 2006). The RPQ-A is a 23-item self-report measure of reactive and proactive aggression. Reactive aggression (utilized for convergence in the current study) is considered to be a type of impulsive aggression, whereas proactive is a planned/predatory type of

aggression. The 23 items are each assessed on a 3-point Likert scale ranging from 0 (never) to 2 (often). The Total score and Reactive subscale were used for convergence with MBS items in the student sample and had excellent and good internal consistency, respectively.

**Outcome Measures**

*Schwartz Outcome Scale-10* (SOS-10; Blais et al., 1999): The SOS-10 is a measure of psychological well-being and health. This measure assesses areas including life satisfaction, interpersonal effectiveness, optimism, positive self-appraisal, and the absence of psychological symptoms with ten items. Each item is rated on a seven-point Likert scale ranging from 0 (never) to 6 (all or nearly all of the time) over the past seven days. The SOS-10 demonstrated excellent internal consistency in the student sample.

**Validity Measures**

*Elemental Psychopathy Assessment Validity Scales* (EPA; Lynam et al., 2011). The EPA is a 178-item self-report measure of personality traits assessing psychopathy. The EPA includes two validity scales (Infrequency and Virtue) that are eight items each, and rated on a 5-point Likert scale ranging from 1 (disagree strongly) to 5 (agree strongly). Recommendations of invalid profiles based on the Infrequency and Virtue scales are provided in the literature (e.g., Lynam et al., 2011) and were used in the current study to identify invalid responders.

*Social Desirability Scale* (SDS; Crowne & Marlow, 1960). The SDS is a 33-item true/false questionnaire that assess social desirability with higher scores denoting an attempt to present oneself in a socially desirable manner. Cronbach's alpha in the current study was acceptable (0.78).

## Procedure

Participants were recruited via the university's research participant pool (SONA) system. The study was open to all participants in the participant pool. Participants completed the study remotely via a secure online survey platform, Qualtrics. All measures were presented in a randomized order. Validity items (EPA; Lynam et al., 2011) were embedded into the surveys to identify invalid responders. Following valid completion of the study, participants were awarded 1.5 SONA research participation credits.

# CHAPTER III

# RESULTS: SAMPLES 1 AND 2

## Data Analytic Process

All analyses were conducted using SPSS version 21. Sample 1 (community sample) and Sample 2 (student sample) were analyzed first using the scale revision process. Then, the MBS items were revised and the new items (MBS-R) were administered to Sample 3 (Mturk sample). The first phase of scale revision with the original MBS in Samples 1 and 2 included reliability analyses (examining Cronbach's alpha, corrected item-total correlations), convergent validity (Pearson *r* correlations), exploratory factor analysis (EFA), and feedback from a focus group of undergraduate research assistants and graduate-level trainees in clinical psychology. The reliability analyses included examination of the MBS total score and for each subset of related items, which had 3 to 4 items each (e.g., substance misuse, risky sexual behavior). The convergent validity analyses included zero-order Pearson *r* correlations between the MBS items and respective self-report narrowband measures, as well as personality variables (e.g., impulsivity). For example, the MBS binging item was correlated with the EDE-Q 6.0 Global Score. Correlations were interpreted with significance testing and Cohen's (1992) conventions where Pearson r correlations below 0.30 represent small or weak

effects, those between 0.30 and 0.49 represent medium or moderate effects, and those above 0.50 represent large effects.

EFA, using principal axis factoring, was conducted to examine the item loadings and communalities to provide information for scale revision, including identification of potential items for deletion and revision. An exploratory factor analytic approach was utilized to examine the performance of the original MBS items and to aid in the revision process in the context of the other indicators (e.g., convergent validity, internal consistency). Based on theory, we would not anticipate a simple structure with a certain number of factors. A common factor analysis (EFA) approach was selected, rather than principal components analysis (PCA), as the goal was not necessarily to reduce to the fewest number of dimensions or items possible. The intention was to retain a wide range of maladaptive behaviors in the screening measure and also assess the performance of items. If items have smaller communalities and/or there are few items per dimension, EFA is recommended over PCA (Floyd & Widaman, 1995). Though the two approaches often produce similar results with a high number of items with high communalities, the MBS did not meet that requirement. In that case, the EFA is recommended (Floyd & Widaman, 1995). Consistent with recommendations for sample size necessary for EFA, we had planned to assess and report the structure of the MBS in the field sample as well ($n$ = 202). However, due to the low levels of correlations among items (86.5% less than 0.30), a larger sample would be required. Specifically, it has been recommended that smaller sample sizes (around $n$ = 150) are sufficient for solutions with a large number of items that have variables with loadings greater than 0.80 (Tabachnick & Fidell, 2001). Specifically within the field sample, only 3 items had loadings greater than 0.80 when a

three-factor solution was examined and overall low communalities of the variables (over 50% of MBS items have communalities under 0.50).

Prior to completing the EFA, a number of indicators were used to determine if the data were factorable (Beavers et al., 2013). First, the correlation matrix between the MBS items were examined, as moderate levels of correlations between factors suggests a base level of communality that is necessary to justify the process of creating valid factors. Next, Bartlett's Test of Sphericity was conducted, which examines the observed correlation matrix of the MBS items to determine if factors are present and if they would be identifiable within the EFA process. Finally, the Kaiser-Meyer-Olkin (KMO) Test of Sampling Adequacy was utilized to examine the shared variance among items; therefore, a high KMO is desired (> 0.80) and low (< 0.49) KMO indicates the scale should not be factored.

Four indicators were implemented to determine the number of factors to extract: Cattell's Scree Plot, Velicer's Minimum Average Partial (MAP) Test, Horn's Parallel Analysis, and the Kaiser Criterion Method (Eigenvalues > 1.0). Theory should also be used to guide the process regarding number of factors and interpretability of factors, while taking the indicators into account. The theoretical basis that guided the MBS development was a measure with a large number of behaviors associated with similar underlying principles (e.g., impulsivity, negative affect, neuroticism, borderline personality traits). However, it was not the intent to have a large number of items per behavior (e.g., self-injury behaviors are assessed with two items, illicit drug use is assessed with one item). Therefore, one could anticipate, consistent with theory, that there would be one general 'impulsive behaviors' factor. On the other hand, one may

expect clusters of items (e.g., eating items: binging, purging, fasting) to emerge as their own, separate factor, resulting in many factors (eating factor, substance factor, etc.). Given that the intent was not to develop subscales, it would be unlikely to end with a number of distinct, clean factors (per subscale) due to the number of items per discrete behavior. Additionally, the EFA process was largely exploratory in nature and the main goal was scale revision. The MBS assesses behaviors with low base rates and the MBS responses are non-normally distributed (see next section). It is important to note that multivariate normality is not a necessary to conduct factor analysis when using Principal Axis Factoring extraction methods (Tabachnick & Fidell, 2001). As mentioned previously, the data were non-normally distributed, but PAF is acceptable to use in these cases and does not necessitate distributional assumptions (Fabrigar et al., 1999; Tabachnick & Fidell, 2001). Principal Axis Factoring (PAF) with oblique rotation (Direct Oblimin) was utilized to extract factors in the initial analyses. Due to the factors being largely uncorrelated (correlations ranged from 0.217 to 0.287), orthogonal (Varimax) rotations were implemented for the following EFA analyses, as recommended by Tabachnick and Fidell (2001).

None of these item assessment approaches within the revision process were used in isolation or as absolute decision making indicators in the process of deleting or retaining an item. Rather, the data and results taken together were utilized in the decision-making process regarding the revision of each item and the addition of new items. An adjusted alpha value of $p < .001$ was utilized for all analyses given the number of statistical tests run in the study.

## Samples 1 (Community) and 2 (Students)

### Descriptive Statistics and Normality

The means and standard deviations of the MBS, personality variables, and wording of all MBS items are presented in the tables (Tables 1-3). The MBS items were non-normally distributed and 24 of 29 items in the community sample and 23 items in the student sample had a high skew (> 2.0) and kurtosis (> 4.0). Some items had higher skew than others; for example: vandalism (skewness = 6.62, kurtosis = 46.19) and use of laxatives/diuretics (skewness = 9.80, kurtosis = 94.86) were more extreme compared to illicit drug use (skewness = 2.63, kurtosis = 6.50) and unsafe sex (skewness = 2.49, kurtosis = 5.12) in the community sample. This was anticipated given the content of the measure and low base rate of behaviors being assessed. The other variables of relevance to the primary and supplementary hypotheses of current study in the community sample (FFMRF, IPIP NEO 120, SUPPS-P, UPPS-P, SOS-10, PD Rating Form, PDQ-4) were normally distributed. A majority of the scales assessing convergence of similar behaviors were normally distributed, although some had high positive skewness and kurtosis (i.e., DUDIT, SBQ-R, SOGS, and ISAS Frequency and Severity).

Sample differences were examined between the MBS total score in the community sample ($M$ = 7.37, $SD$ = 6.08) and student sample ($M$ = 6.85, $SD$ = 6.30). An independent samples $t$-test demonstrated no significant difference between samples, $t(528) = 0.89$, $p$ = 0.38. Additionally, with the final sample of participants in each sample, socially desirable responding was assessed using the SDS (Crowne & Marlowe, 1960). In the student sample, 7.2% participants responded with a score indicating they were willing to respond truthfully, 61.8% that responded with average concern for

conformity, and 24.8% that scored in the range that tend to be more concerned about how their responses may appear to others in terms of acceptability.

**Reliability**

Cronbach's alpha for the MBS total scale was 0.748 (acceptable) in the community sample and 0.801 (good) in the student sample. Corrected total-item correlations (correlation of each item with the scale without that item included) were examined to assess for redundancy and none were negative or extremely high (>.70). Cronbach's alpha if item deleted suggested the total scale alpha would improve if three items were removed: binging (MBS12; $\alpha = 0.753$), texting and driving (MBS22; $\alpha = 0.761$), and vandalism (MBS29; $\alpha = 0.749$) in the community sample. Similarly, Cronbach's alpha if item deleted suggested the total scale alpha would improve if texting while driving were removed (MBS 22; $\alpha = 0.821$) in the student sample.

Cronbach's alpha for each subset of items are presented in Table 1. Within each subset, the following MBS items, if removed, would improve the internal consistency of that content area. Across both samples, these items included MBS2 (consumed too much alcohol), MBS7 (sex with someone you didn't want to), MBS8 (unsafe sex), MBS9 (nonsuicidal self-injury), MBS12 (binging), MBS21 (speeding ticket), MBS23 (impulsive spending), MBS26 (argument with close friend/family), and MBS29 (vandalism). Additionally, items MBS15 (abused laxatives or diet pills), MBS19 (stolen from acquaintances/friends/family), and MBS22 (texting and driving) were problematic in the community sample, and MBS16 (eaten food in grocery store before paying) in the student sample. While the goal was not to develop subscales of the MBS, this process provided useful statistical information regarding the items that may be tapping into similar areas,

and/or questions in which wording is discrepant from the themes of the other items within that content area.

## Convergent Validity

### Personality Measures

The MBS total score was examined in relation to the hypothesized personality variables (Table 4). As hypothesized, the MBS total score was positively correlated with the neuroticism domain and impulsivity facet in both samples and angry hostility facet in the student sample, but was not significantly related to other facets of neuroticism. The MBS total score was not significantly correlated with the extraversion domain or excitement-seeking facet in either sample. The hypothesized relationships between MBS total score and the agreeableness and conscientiousness domains and facets were not supported in the community sample and were partially supported in the student sample (see Table 4). It was hypothesized that the MBS total score would be positively correlated with the five facets of the UPPS-P impulsivity model. The results indicated this hypothesis was partially supported such that the MBS total score was positively correlated with negative urgency and positive urgency in both samples, and the lack of premeditation and lack of perseverance facets in the student sample (Table 4). Sensation seeking was not significantly correlated with the MBS total score in either sample.

### Behavioral-Outcome Measures

Table 5 lists the convergent correlations between each MBS item and the respective narrowband self-report behavioral measure specific to the student sample. For example, MBS1 (illicit drug use or misuse of prescription drugs) was examined in relation to the DUDIT total score ($r = 0.57$, $p < .001$) and MBS3 (driven under the

influence of drugs and/or alcohol) was examined in relation to the DUDIT total score ($r$ = 0.42, $p$ < .001) and AUDIT total score ($r$ = 0.34, $p$ < .001). Many of the items had significant correlations (small to large effects) with their respective measures. The exceptions are items MBS7 (had sex with someone you didn't want to have sex with), MBS9-MBS11 (self-harm/suicide), MBS15 (abusing laxatives), MBS16-MBS19 (impulsive stealing), and MBS21 (speeding ticket).

Due to the insignificant relationships of the self-harm/suicide items with well-validated measures (i.e., ISAS severity, frequency), the MBS items were re-examined in relation to the ISAS frequency scores categorized by severity level. ISAS frequency collapsed across all levels (superficial, moderate, severe) was not significantly correlated with MBS9 (hurting self on purpose), $r$ = -0.003, $p$ > .05, or MBS10 (hurting self on purpose severely enough to require medical treatment), $r$ = -0.01, $p$ > .05. Examining ISAS frequency across severity level provided additional information. Specifically, MBS9 was significantly correlated with ISAS frequency of severe self-harm ($r$ = 0.21, $p$ < .001), but was not substantially related to moderate ($r$ = 0.11, $p$ < .05) or superficial ($r$ = -0.01, $p$ > .05) self-harm behaviors. MBS10 was not significantly correlated with any of the ISAS frequency categories ($r$s ranging from -0.02 to -0.01). It is also important to note the endorsement of MBS10 was very low, with only three individuals endorsing the behavior. Due to the low variance, a correlation coefficient was not produced for MBS10 with ISAS severity.

**Discriminant Validity**

The MBS total score was examined in relation to facets of the FFM that would not be hypothesized to have a substantial relationship with impulsive, maladaptive

behaviors in order to examine discriminant validity (i.e., FFM Openness to Experience domain and facets). This hypothesis was primarily supported in both samples such that the Openness to Experience domain and facets had small, insignificant relationships with the MBS total score, with one exception (actions facet in the community sample, $r$ = 0.30, $p < .001$). The discriminant validity correlations are presented in Table 7.

**Factor Analysis**

A number of factors were examined to determine if the MBS items were factorable in student sample (i.e., correlation matrix, Bartlett's test, KMO). The inter-item correlations ranged from 0.01 to 0.89. A closer examination of the correlations indicates that most (87%) were less than 0.30, 11% were between 0.30 and 0.49, and 2% were large (> 0.50). The relatively small relationships between the variables are likely due to the invariance among the MBS items. Specifically, the mean of the MBS scores ranged from 0.02 to 1.81, with the mode for all items in the student sample equaling 0 (not at all within the past month). Additionally, the low item correlations within the MBS may be a result of the intentional wide variety of behaviors represented in the measure (e.g., we would not necessarily anticipate binging and theft to have a very large correlation). Bartlett's Test of Sphercity was significant ($\chi^2 = 4257.28$, $p < .001$), indicating that the observed matrix is different than a singular matrix, which is ideal for EFA. The KMO for the MBS items was "middling" at 0.793, which is approaching the desired level of 0.80 (Kaiser, 1974). Based on these indicators, an EFA may be inherently problematic though the indicators would not collectively suggest that it is not recommended to conduct the EFA. However, the results should be interpreted with caution. The four indicators used to determine the number of factors to extract suggested

3 to 11 factors. Specifically, Cattell's Scree Plot and the MAP Test suggested 3 factors, Eigenvalues suggested 8 factors, and Parallel Analysis suggested 11 factors. The Eigenvalues and Parallel Analysis approaches often suggest a greater number of factors than are present (e.g., Buja & Eyuboglu, 1992). As mentioned previously, the factor analytic approach was exploratory in nature, with a primary goal of scale revision. Based on theory and the indicators provided by the data, two solutions (3 and 4 factors) were examined.

The three-factor solution (Principal Axis Factoring, Varimax rotation) cumulatively explained 38.75% of the variance, three items were dropped for loadings < 0.30 (MBS 12, MBS21, MBS29), and five items had significant cross-loadings (MBS3, MBS5, MBS6, MBS16, MBS24). Factor 1 included 6 items (domains included: substance, sexual impulsivity, self harm/suicide, gambling) and 4 cross-loaded items. Factor 2 included 10 items (domains: substance use, sexual impulsivity, driving, spending, aggression) and 3 cross-loaded items. Factor 3 included 7 items (domains: eating behaviors, theft) and 1 cross-loaded item. Additionally, many items had smaller factor loadings (0.30-0.59), with only 6 items with loadings > 0.60.

The four-factor solution (Principal Axis Factoring, Varimax rotation) cumulatively explained 44.59% of the variance, two items were dropped for loadings < 0.30 (MBS 13, MBS29), and four items had substantial cross-loadings (MBS3, MBS5, MBS17, MBS28). Factor 1 included 9 items and 2 items with cross-loadings (domains: sexual impulsivity, self harm/suicide, purging, laxatives, theft). Factor 2 included 8 items and 2 items with cross-loadings (domains: substance use, unsafe sex, binging, driving, spending, arguing). Factor 3 included 3 items and 1 additional item that cross-loaded with

factor 1 (domains: theft, aggression). Factor 4 included 4 items and 2 items with cross-loadings (domains: substance, gambling, aggression). Additionally, many items had smaller factor loadings (0.30-0.59), with 8 items that had loadings > 0.60.

The other solutions were explored (5-11 factors); however, none of them provided an optimal factor structure. For instance, the 8-factor solution explained 61.83% of the variance, which is much improved from 44.59% in the previously model discussed (item-level analyses should explain 50% or more of the variance). However, when examining the rotated factor loadings, some factors had very few (1-2) items, which is unacceptable for retaining a factor. Generally, factors should have 4 or more items to be retained.

**Scale Revision Process**

In addition to the aforementioned analyses, a focus group was conducted prior to scale revision. The focus group included discussion of the items including wording and implied meaning (e.g., does "too much alcohol for your own good" imply binge drinking or another meaning? Is "unsafe sex" descriptive enough?). Following these procedures, the scale revision included deletion of two items, addition of three items, revision of 14 items, 12 items remained with no changes. The changes are described below and all items (original and revised) are in Table 2. Item MBS4 was deleted based on the focus group feedback, as well as feedback from participants during community data collection. MBS22 was deleted based on the internal consistency indicators (at total scale level, as well as impulsive driving content level) and assessing item content consistent with impulsive behaviors associated with negative affect. A number of items were revised to include more descriptive examples. These items included MBS1, MBS8, MBS9, and MBS28. For example, MBS1 was previously worded, "used illicit drugs or misused

prescription drugs" and was revised to "used illicit drugs (e.g., meth, cocaine, ecstasy, inhalants, PCP) or misused prescription drugs". MBS18 was also revised to include additional examples as the original examples (clothing, jewelry) seemed female gender specific and therefore was revised to be more balanced (now also includes electronics).

A number of items were revised to be more descriptive, which included adding phrases or wording to more accurately describe the intended behavior (i.e., MBS2, MBS7, MBS12, and MBS27). For example, MBS2 was revised to include "binge drinking" and MBS7 was revised to include "engaged in sexual activity you weren't comfortable with" following assessment of internal consistency and the focus group. MBS12 was problematic in terms of internal consistency at the total and content scale levels, as well as the EFA results. The literature and validated scales of maladaptive eating patterns were consulted and this item was revised from "binged on large amounts of food" to "binged on unusually large amounts of food".

Finally, a set of items (MBS15, MBS16, MBS25, MBS29) were modified very slightly (e.g., one word) to be more descriptive of the intent of the question or to clarify the item. For example, the word "before" was changed to "without" in MBS16 ("eaten food in the grocery store before paying for it"). MBS 29 was revised to include public property as a target of vandalism, in addition to school and private property. These items were revised based on the results primarily from Cronbach's alpha, convergent validity, and the focus group feedback.

Items were added to reflect the limitations of original marijuana item. The new items assess marijuana use associated with impairment and problems related to substance use more generally (revised MBS4-5). One sexual impulsivity item was added to further

assess “unsafe” sex, as the original item had problematic statistical qualities and was ‘unclear’ according to participants. Rather than add “had multiple sexual partners” to MBS8 as a descriptor, this was considered a distinct behavior and was included as a new item (revised MBS7).

The wording of one scale anchor was revised to “every day or nearly every day *within the past month*” from the original “every day or nearly every day” to address feedback from participants during data collection with the community sample. The revised MBS (MBS-R) was then administered to the Sample 3 through Amazon’s Mechanical Turk. Retained original items, revised items, and new items were administered to participants. Original versions of significantly revised items were also administered to compare performance of the old and revised/new items. The original versions of the items were embedded within the self-report measures of behavioral outcomes and administered separate from the revised MBS. For example, the original version of MBS3 (consuming to much alcohol) was administered with the Alcohol Use Disorders Identification Test (AUDIT) block.

# CHAPTER IV

# METHODOLOGY: SAMPLE 3

## Participants

Participants were solicited from Amazon's Mechanical Turk. Participants (i.e., "Workers") who met study restrictions (95% HIT completion rate, reside in the United States) could view the description and sign up for the study (i.e., "HIT"). Two hundred and fifteen Workers responded to the solicitation and submitted a completion code to Mturk. Of those, Workers data were eliminated for the following reasons: seven Workers did not pass the EPA infrequency validity check, 26 failed the EPA virtue validity check, one had more than 20% missing data, two took the survey on separate occasions, and three Workers completed the survey in less than 30 minutes and had strings of the same value. The remaining set of participants ($N$ = 177) was used for the analyses.

The participants were 18-77 years ($M$ = 38.76 years, $SD$ = 12.55) and 60.5% identified as female and 39.5% as male. Participants reported their ethnicity as follows: 83.1% Caucasian, 10.7% African American, 6.2% Asian, 4.5% Hispanic/Latino, 1.7% American Indian/Alaska Native, and 0.6% as 'Other' (percentages sum to > 100% as participants could select more than one ethnicity; 6.2% identified with more than one category). Psychiatric treatment history was assessed; 13% of participants reported they were in treatment at the time of the survey, 6.2% in treatment within the last year, 22.6% in

treatment more than one year ago, and 55.4% had no history of treatment. An additional 2.8% of participants declined to provide information regarding treatment history. Participants were also asked about history of legal issues and 46 participants (25.9%) reported legal troubles in one or more of the following areas: driving violations (18%), alcohol (9.6%), drugs (6.2%), theft (2.8%), and assault (2.8%).

**Measures**

The same measures that were administered to the student sample were administered to the Mturk sample, with the exception of the Revised MBS in place of the original MBS. The internal consistencies of the measures from sample 3 are included in the tables (i.e., Tables 1, 3, 6, and 9) measures are listed here to provide the internal consistency in the Mturk sample.

**Procedure**

All participants were recruited via Amazon's Mechanical Turk system. The study was open to all participants 18 years of age and older, who reside in the United States, were registered as Workers on the Amazon system and met prerequisite Worker requirements (see Participant section). Individuals consented and completed the study via Qualtrics, a secure online survey platform. All measures were presented in random order. Compensation ($2.50) was provided by payment into their Amazon Mechanical Turk account following participation in a valid fashion. Compensation for time spent participating in the current study was comparable to the published median of other studies using Amazon's Mechanical Turk at $1.38 to $1.66 per hour (Horton & Chilton, 2010; Paolacci, Chandler, & Iperirotis, 2010).

# CHAPTER V

# RESULTS: SAMPLE 3

## Descriptive Statistics and Normality

The means and standard deviations of the revised MBS items are in Table 1 and personality variables in Table 3. The revised MBS items were non-normally distributed and 27 of 30 items had high skewness (> 2.0) and kurtosis (> 4.0). Binging, impulsive spending, and arguing with close family/friends were normally distributed. As with the other two samples, non-normality of the MBS data was anticipated given the content of the measure and low base rate of behaviors being assessed. The following measures were normally distributed in the Mturk sample: IPIP NEO, SOS-10, UPPS-P, AUDIT, CUDIT, EDE-Q, ISAS Severity, KSAS, RPQ, SBQ-R, and all PDQ-4 subscales with the exception of PDQ-4 Antisocial. The following measures/subscales were non-normally distributed: PDQ-Antisocial scale (skewness = 2.02), DUDIT, ISAS Frequency, and SOGS. The social desirability scores (SDS) were evaluated within the Mturk sample. A total of 4.5% of participants responded in the lowest score category (truthful responding likely), 44.8% in the average conformity range, and 30.6% in the range that tends to be concerned with how their responses will appear to others.

## Reliability

The internal consistency of the Revised MBS was excellent ($\alpha = 0.919$), which was

improved from the original MBS in the community sample ($\alpha = 0.748$) and student sample ($\alpha = 0.801$). Three items would improve Cronbach's alpha of the total score if deleted (MBS1, illicit drug use; MBS10, unsafe sex; MBS14, binging), though each item would individually raise Cronbach's alpha minimally ($\leq 0.004$). The internal consistency of each subset of items ranged from 0.611 (impulsive driving) to 0.833 (impulsive stealing) is included in Table 1.

**Convergent Validity**

**Personality Measures**

All convergent validity relationships between the Revised MBS total score and FFM personality traits can be found in Table 4. As hypothesized, the MBS-R total score was positively correlated with the neuroticism domain and the angry hostility and depressiveness facets, but was not significantly correlated with the other neuroticism facets. The MBS-R total score was not significantly correlated with extraversion domain or facet of excitement seeking. The MBS-R total score was negatively correlated with the Agreeableness domain and three facets (straightforwardness, compliance and modesty). While the MBS total score was not significantly correlated with conscientiousness domain, it was significantly negatively correlated with two facets, dutifulness and deliberation. All of the convergent relationships between the FFM traits and MBS-R were small to medium effects. Regarding impulsivity-specific facets of the FFM, it was specifically hypothesized that the revised MBS would be positively correlated with the five facets of impulsivity (UPPS-P). Consistent with the other two samples, the total score was positively correlated with negative and positive urgency. The Revised MBS was also positively related to sensation seeking.

**Behavioral-Outcome Measures**

The entire list of convergent correlations of the revised MBS with self-report behavioral outcomes is presented in Table 7. Most items demonstrated significant convergent relationships with their respective measures and had small to large effects. Only five items did not demonstrate significant convergent associations. Specifically, MBS4 (used marijuana to the point you weren't engaging in other activities), MBS6 (one night stand), MBS12 (severe NSSI), MBS13 (attempted suicide), and MBS21 (stolen items from others) did not have significant effects. While MBS4 had a medium sized correlation coefficient ($r = 0.44$, $p < .01$), only 39 individuals endorsed cannabis use in the Mturk sample, therefore, the analysis was underpowered and was not significant at the conservative alpha cutoff of $p < 0.001$.

As with the original MBS self-harm items (revised MBS11, MBS12), the revised items were examined in relation to the ISAS severity and frequency scores. ISAS frequency of self-harm in general (collapsed across all levels of superficial, moderate, severe) was significantly correlated with revised MBS11 (hurting self on purpose), $r = 0.25$, but not with revised MBS12 (hurting self on purpose severely enough to require medical treatment), $r = -0.03$. Examining ISAS frequency across severity level demonstrated that revised MBS11 was significantly correlated with ISAS frequency of severe ($r = 0.38$, $p < .001$) and moderate ($r = 0.37$, $p < .001$) self-harm, but was not substantially related to superficial ($r = 0.13$, $p > .05$) self-harm. MBS12 was not significantly correlated with any of the ISAS frequency categories. MBS13 (attempted suicide) had a very low endorsement rate in the Mturk sample ($n = 3$).

In contrast to the original MBS eating items, all had significant convergent relationships with the behavioral outcome self-report measures in the Mturk sample. Unlike the student sample, the impulsive stealing items did demonstrate medium effect size relationships that were significantly correlated with KSAS. The only MBS item that was not significantly correlated with the KSAS total score was MBS21 (stolen items from others).

**Discriminant Validity**

The Revised MBS total score was again examined in relation to the FFM Openness to Experience domain and facets (Table 7). Consistent with the hypotheses, the Revised MBS was not significantly correlated with the openness to experience domain or facets.

**Comparison of MBS Original and Revised Items**

The items that were revised or altered (with the exception of items that were revised to include examples) were compared to the original items in the Mturk sample. The mean, standard deviation, and convergent validity of each item with the respective scale are included in Table 8. As shown in Table 8, most of the means were very similar across revised items with the exception of the NSSI item. The original item ('Hurt yourself on purpose (e.g., cutting, scratching, burning)') had a higher mean ($M$ = 0.39) than the revised item ('Hurt yourself on purpose (e.g., pinching, biting, cutting, scratching, burning) without intending to kill yourself?'; $M$ = 0.15). Fisher's $r$-to-$z$ transformations were utilized to test the difference between the correlation coefficients. None of the convergent correlations were significantly different when comparing the original and revised items in the same sample.

**Supplemental Hypotheses**

It was hypothesized the MBS total score would be associated with general outcomes/functioning (SOS-10) and personality disorder symptomology across all samples. The results of these analyses are presented in Table 9 for the three samples. It was expected that the MBS total score would be negatively correlated with the SOS-10, which was supported in the Student sample ($r$ = -0.22, $p$ < .001) but not in the Community ($r$ = -0.14, $p$ > .05) or Mturk samples ($r$ = -0.14, $p$ > .05). It was hypothesized that the MBS total score would be positively correlated with the borderline and antisocial PD scales, which was supported in each sample (Table 9).

# CHAPTER VI

# DISCUSSION

The Maladaptive Behavior Scale (MBS) is a brief assessment tool intended to measure impulsive behaviors associated with negative affect. There currently exists a dearth of validated measures that directly assess the frequency of engagement in a range of impulsive behaviors. The MBS addresses this need for a short measure of maladaptive behaviors, specifically by assessing behaviors associated with negative affect and borderline personality traits in a 30-item questionnaire. The potential utility of the MBS may span across research and clinical settings. The MBS may be particularly useful for tracking behaviors over time in research studies (e.g., ecological momentary assessment). Additionally, the MBS may serve as a useful tool for clinicians and clients to track behaviors and progress over time. Finally, the MBS may serve as a screening measure in a large setting such as a college university health clinic or hospital emergency room to identify at-risk individuals that may need referrals for behavioral health services.

The purpose of the current study was to refine and validate the recently developed Maladaptive Behavior Scale (MBS). The MBS was originally designed to assess impulsive and risky behaviors associated with negative affect and borderline personality

disorder. Impulsive behaviors (e.g., substance misuse, risky sex, spending) and self-harm/suicidal behaviors are symptoms of borderline personality disorder. These behaviors are often used as attempts to regulate affective instability (another symptom of borderline personality disorder) and these behaviors are theorized to contribute to the emotion dysregulation cycle (Carpenter & Trull, 2013; Selby & Joiner, 2009). Research studies examining these models need brief measures of the relevant impulsive behaviors, such as the MBS.

The present study utilized three adult samples to examine scale properties and convergent validity with the intent of improving the original MBS through internal validation (e.g., internal consistency) and external validation procedures (e.g., convergent validity). The original MBS was first administered to two samples (community sample and college student sample) and the revised MBS was administered to a third sample (Amazon Mturk sample with adults from the United States). A number of statistical and theoretical processes were implemented to revise the scale following the first two data collections. Specifically, guidelines and recommendations from a construct validation approach to scale construction (e.g., Clark & Watson, 1995; Simms & Watson, 2007) were utilized. Internal consistency, convergent validity, theory, EFA, and focus groups were utilized to refine the MBS items. Construct validity was examined with convergent and discriminant relationships with measures of similar behavioral outcomes and criterion validity were examined with personality and impulsivity measures. As a result of the overall process, a number of items were deleted or revised.

The revised MBS contains 30 items and assesses the same content areas (substance use, sexual impulsivity, self-harm/suicide, binging/purging, impulsive

stealing, reckless driving, impulsive spending/gambling, aggression) as the original MBS with the exception of reassurance seeking, which was removed prior to any analyses within the current study. Following this examination of the data from the original MBS in the first two samples, and the revision of the MBS scale, the revised MBS (MBS-R) was administered to the third sample (Amazon Mturk). The MBS-R then went through psychometric evaluation (i.e., internal consistency) and extensive examination of validation, including construct and criterion validation.

Consistent with our hypotheses, the MBS-R total score is positively associated with FFM neuroticism and two facets (angry hostility and depressiveness) and negatively associated with agreeableness and three facets (straightforwardness, compliance, modesty), and two facets of conscientiousness (dutifulness and deliberation). The other hypothesized relationships between the FFM and MBS total score (e.g., neuroticism facet of impulsivity, conscientiousness domain) were not supported. While the hypothesized relationships spanned entire domains (e.g., all six facets of neuroticism, agreeableness, and conscientiousness were excepted to related to MBS total score), the results of the study demonstrate that the facets are more differentially related to the MBS than anticipated. For instance, while the neuroticism domain was consistently related to the MBS/MBS-R across all three samples, only two facets (angry hostility, depressiveness) were significantly associated with the MBS total score in two of the samples, whereas the other facets were not. Facet-level analyses may provide more detailed examination of the association between FFM facets and maladaptive behaviors. For instance, trait anxiousness may not play as significant of a role compared to trait angry hostility in the context of maladaptive behaviors relevant to the current study.

Also consistent with the hypotheses, the revised MBS was positively associated with the UPPS-P impulsivity model, specifically the facets of negative and positive urgency and sensation seeking. As discussed previously, the MBS intends to assess behaviors that may be utilized with the intention of reducing negative affect, or regulating unstable affect. The relationship between the MBS/MBS-R the UPPS-P negative urgency facet provides preliminary support for this idea. Based on the literature regarding the UPPS-P facets' relationship with maladaptive behaviors, it was hypothesized that all of the impulsivity facets, including lack of premeditation and lack of perseverance would be positively related to the MBS total score. Previous studies have found associations between each of the UPPS-P facets with various behaviors (e.g., nonsuicidal self-injury, maladaptive eating behaviors), and some literature is mixed. However, the most consistent findings tend to be with the urgency facets. This is fairly consistent with the findings of the current study. While all of the UPPS-P/SUPPS-P facets were related to the MBS total score within at least one sample, the overall hypothesis was not fully supported in the Mturk sample. The positive and negative urgency facets of the UPPS-P model were related to the total score of the original and revised MBS and replicated across samples. These findings may suggest the specific behaviors and manner in which they are assessed on the MBS in particular are more related to the facet of urgency (based on FFM neuroticism facet of impulsivity) rather than the other UPPS-P facets, which are based on extraversion and conscientiousness facets (excitement seeking, deliberation and self-discipline).

The consistent association between UPPS-P and SUPPS-P urgency facets with the MBS is noteworthy given that the general FFM trait, impulsiveness (FFMRF/IPIP NEO),

was not consistently associated with the MBS total score in all three samples. The UPPS-P/SUPPS-P negative urgency scale specifically examines impulsivity under conditions of negative affect, which directly associated with the MBS behaviors and intent of the measure. The general personality trait, impulsiveness (neuroticism facet of the FFM) assesses the tendency to act on urges, without such emphasis on negative affect in the item content. For example, the general personality measures used to measure FFM impulsiveness (FFMRF, IPIP NEO) have items that focus on overindulging, giving into cravings, and describing oneself as 'tempted'. These do not include the component of regulating affect when acting impulsively. However, the item content of the UPPS-P/SUPPS-P items include wording such as engaging in behaviors "in order to feel better". Therefore, it is not surprising that there was a significant, and stronger association between the UPPS-P/SUPPS-P urgency facets of impulsivity with the MBS compared to the FFM impulsiveness facet.

The urgency facets of the UPPS-P/SUPPS-P are the most theoretically consistent with the intent of the MBS measure, such that the goal is to assess behaviors that are impulsively carried out to regulate affect. Additionally, while sensation seeking is often associated with impulsive behaviors (e.g., sexual risk taking), it is more often seen in relation to behaviors such as skydiving or other excitement seeking behaviors that were not the focus of the current study. The small relationship between the MBS total score and UPPS-P sensation seeking is congruent with the small association between FFM excitement seeking (extraversion facet) and MBS total score. These results provide some additional direction regarding the types of impulsive behaviors assessed with the MBS. Future research may examine the intent of the behavior for the individual, which may

further clarify the results of the association between impulsivity and total maladaptive behavior scores.

The internal validation procedures improved with the revision of the scale. Specifically, following the revision process of the MBS, the internal consistency of the total scale score improved from "good" to "excellent". Additionally, when examining the internal consistency of the content areas (e.g., substance use, sexual impulsivity), the Cronbach's alpha of five of the eight content areas (substance use, sexual impulsivity, binging, stealing, driving) had improved with the revised measure compared to the original measure. For the three items that were not improved/increased, there were no statistical differences between the relationships. The convergent validity of specific revised items compared to original items (8 items total) was directly compared.

Additionally, the external validation procedures of the MBS-R demonstrated that many of the convergent relationships with self-report measures of behavioral outcomes were of similar magnitude or improved when comparing to the original MBS. The convergent validity provides good initial support for the revised MBS, though additional research is necessary. A majority of the MBS revised items demonstrated moderate to strong convergence with self-report measures of respective behavioral outcomes. The sexual impulsivity items had smaller effect sizes with their respective convergent measures compared to other behaviors. The nonsuicidal self-injury (NSSI) and suicide items on the revised MBS had smaller and mostly insignificant relationships with the measures selected for convergent validity assessment. This was also the case for the NSSI and suicide items on the original MBS, though they did demonstrate marginal

improvement following revision. Potential reasons for the lack of convergence with the NSSI/suicide items are discussed in detail below.

The NSSI/suicide items were inconsistent with this pattern and may be showing weaker or lack of convergence for a few reasons. One reason may be the low frequency of endorsement of those items within the samples. These were behaviors that were endorsed by a small subset of the sample on the MBS, and with low frequency when endorsed. Additionally, only approximately 70 participants in the student sample and 40 in the Mturk sample endorsed NSSI behaviors. Therefore, the sample size utilized for those correlations was much smaller as the relationship was examined in only a subset of participants. There was not adequate power or high enough base rates of behaviors within the samples of the current study to detect an effect if one existed. A similar pattern was noted with the convergence of the marijuana use items on the revised MBS and the CUDIT. Approximately 40 participants endorsed marijuana use, thus, the correlational analyses for the convergent validity of that item was underpowered. It is anticipated that with a more targeted (i.e., inpatient clinical) sample and larger sample size, the effects of the convergent validity would be stronger with those items in particular.

Another plausible contribution to the low convergence of the NSSI items with ISAS Frequency in the student sample was the wording of the original NSSI item. The examples of self-harm included in the original version of this item were only "severe" examples of self-injury (e.g., cutting) and did not include "pinching" or "biting", which are considered to be less severe forms of NSSI. These descriptions of less severe forms were added to the revised item description. When looking at the item's convergence with NSSI frequency categorized by the severity level (superficial, light, severe), the

relationship was stronger when isolating frequency of light/moderate and severe behavior, suggesting that participants may have been responding to the item for more severe types of NSSI only. Therefore, it is not surprising that the overall general frequency (collapsing across all severity levels) of NSSI behaviors was significantly related to the MBS item after revising the NSSI item to include a wider range of examples.

Supplemental analyses provided evidence for convergence of the MBS total score with personality disorders, particularly "cluster B" personality disorders. The MBS total score (both original and revised) was significantly related to borderline, histrionic, and antisocial personality disorder symptoms in all three samples. The revised MBS was also related to paranoid personality disorder symptoms. It was also hypothesized that the MBS total score would be negatively associated with general outcomes and functioning. This hypothesis was not supported. While the correlation was negative, it was an unsubstantial relationship and was insignificant in the Mturk sample using the revised MBS. Given the limited range of maladaptive behaviors reported, further research within targeted samples may be needed to detect the true relationship between these the revised MBS and functioning.

One consideration of the current study is the influence that social desirability may have had on individual's responses on the MBS and other self-report measures of behavioral outcomes (e.g., substance use on the CUDIT). The behaviors assessed in the current study are behaviors that participants may wish not to report on, or not report on truthfully for a number of reasons, including embarrassment or shame. Additionally, a number of items in the MBS ask about engagement in potentially illegal activities (e.g.,

illicit drug use, vandalism, theft), and individuals may not answer honestly, despite the survey data being recorded anonymously in all of the samples, and recorded remotely online in two of the samples. For both online samples, stringent validity criteria were utilized to eliminate participants from the dataset that responded the survey in an invalid manner due to random or virtuous responding. After eliminating those participants, there was evidence of socially desirable responding (SDS scores) in 25% of the student sample and 30% of the Mturk sample, specifically that those individuals responded in a way that suggested they are likely concerned about how others' view their responses. The remainder of each sample had SDS scores that would suggest no evidence of, or average levels of socially desirable responding. The SDS total score was examined in relation to the MBS total score in the student ($r$ = -0.32, $p$ < .001) and Mturk ($r$ = -0.18, $p$ = .04) samples. There is some evidence for the association between lower MBS endorsement scores and higher SDS scores (small to medium associations). However, it's important to consider the findings about social desirability in the context of assessing self-report personality measures. Specifically, adjusting or accounting for socially desirable responding does not improve the validity of personality variables, and may actually attenuate actual effects (McCrae & Costa, 1983). A study examining the NEO PI-R and scales of social desirability found that those who scored higher on measures of social desirability were actually better adjusted (McCrae & Costa, 1983). This could suggest that high scorers on the SDS in the current study were in actuality more well adjusted (resulting in lower endorsement maladaptive behaviors) rather than attempting to present themselves in a more favorable light than is actually true (e.g., underreporting engagement in maladaptive behaviors).

A strength of the current study is the use of three adult samples, and the inclusion of a community sample. This is particularly relevant given the future goal for use of this type of measure to be implemented as a community-based screening measure in medical and/or psychiatric treatment centers or clinics. An additional advantage of the study is the use of both brief and longer measures of the constructs (e.g., FFMRF and IPIP-NEO) used to assess convergence with general personality traits, personality disorder symptoms, and impulsivity. Demonstrating convergence across samples and measures provides stronger support for the MBS validation, particularly when the results replicate.

**Limitations and Future Directions**

One consideration of the current study is the low endorsement of the behaviors assessed with the MBS. All of the individual MBS items, with the exception of texting and driving, which was dropped for the MBS-R, had a mean below 1.0, suggesting that the behaviors happened on average, less than once per month. The invariance is problematic and would likely be the case with another similar sample given that the targeted time period of assessment was within the past month. If assessing the behaviors over a longer period of time (e.g., over the past few years), the variability would increase; however, it would largely deviate from the intent of the scale and purpose of the validation procedure. Similarly, when certain behaviors were endorsed on the self-report measures (e.g., cannabis use, self-injury), the base rates were low and therefore a limited number of participants completed those questionnaires. Therefore, some of the convergent validation procedures were underpowered.

Although each sample had at least one quarter of the sample endorsing current or past psychiatric treatment, this was not a clinical sample and did not have high

frequencies of maladaptive behaviors. Statistically, this can impact the findings and caution should be taken when interpreting the results. Examining the MBS in a clinical or inpatient sample, particularly a sample with a high base rate of these maladaptive behaviors, would be beneficial to further validate the scale. While the three samples were diverse from one another and provided a range of demographics, the samples were all relatively healthy. With greater variability of behavior endorsement, the MBS may be subjected to an EFA and CFA to determine the factor structure of the scale. A large sample with a clinically relevant population would be necessary to address this important question.

Additionally, the clinical utility and acceptability of the measure should be assessed across various settings. For example, this measure may be utilized in a wide range of settings from serving as a screening measure (e.g., routine physical at physician office) to a clinical tracking tool in psychotherapy. Both the utility in terms of feasibility, acceptability, and applicability from the provider and patient's perspective should be considered. Additionally, the utility of the MBS as a tool within daily diary/EMA studies is an important area for future research. Data is currently being collected that can further investigate the utility and implications of using the MBS in this manner.

**Conclusion**

The Maladaptive Behavior Scale is a brief, 30-item measure that assesses the engagement in a wide range or impulsive and risky behaviors associated with impulsivity and negative affect. The MBS is intended to assess the frequency of the behaviors within the past month and has been validated with measures of general personality, impulsivity, and self-report measures of behavioral outcomes in three adult samples, including a

college student sample, community sample, and Amazon Mturk sample. The MBS has been revised (MBS-R) and has demonstrated excellent internal consistency and construct validity. The MBS may be utilized as a screening measure or measure to track clinically relevant impulsive behaviors over time in treatment.

# REFERENCES


Adamson, S. J., Kay-Lambkin, F. J., Baker, A. L., Lewin, T. J., Thornton, L., Kelly, B. J., & Sellman, J. D. (2010). An improved brief measure of cannabis misuse: the Cannabis Use Disorders Identification Test-Revised (CUDIT-R). *Drug and Alcohol Dependence, 110,* 137-143.

Aman, M. G., & Singh, N. N. (1986). *Aberrant Behavior Checklist: Manual*. East Aurora, NY: Slosson Educational Publications.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Anestis, M. D., Bagge, C. L., Tull, M. T., & Joiner, T. E. (2011). Clarifying the role of emotion dysregulation in the interpersonal-psychological theory of suicidal behavior in an undergraduate sample. *Journal of Psychiatric Research, 45,* 603-611.

Anestis, M. D., Selby, E. A., & Joiner, T. E. (2007). The role of urgency in maladaptive behaviors. *Behavior Research and Therapy, 45*, 3018-3029.

Arthur, W., & Graziano, W. G. (1996). The five-factor model, conscientiousness, and driving accident involvement. *Journal of Personality, 64,* 593-618.

Bagby, R. M., & Farvolden, P. (2004). The personality diagnostic questionnaire–4 (PDQ–4). In M. J. Hilsenroth, D. L. Segal, & M. Hersen (Eds.), *Comprehensive handbook of psychological assessment*: *Vol. 2. Personality assessment* (pp. 122–133). New York, NY: Wiley.

Bagby, R. M., Vachon, D. D., Bulmash, E. L., Toneatto, T., Quilty, L. C., & Costa, P. T. (2007). Pathological gambling and the five-factor model of personality. *Personality and Individual Differences, 43,* 873-880.

Baumeister, R. F., & Scher, S. J. (1988). Self-defeating behavior patterns among normal individuals: Review and analysis of common self-destructive tendencies. *Psychological Bulletin, 104,* 3-22.

Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J. & Esquivel, S. L. (2013). Practical considerations for using exploratory factor analysis in educational fesearch. *Practical Assessment, Research & Evaluation*, 18, 1-13.

Berg, J. M., Latzman, R. D., Bliwise, N. G., & Lilienfeld, S. O. (2015, March 30). Parsing the Heterogeneity of Impulsivity: A Meta-Analytic Review of the Behavioral Implications of the UPPS for Psychopathology. *Psychological Assessment*. Advance online publication. http://dx.doi.org/10.1037/pas0000111

Berman, A. H., Bergman, H., Palmstierna, T., & Schlyter, F. (2005). Evaluation of the Drug Use Disorders Identification Test (DUDIT) in criminal justice and detoxification settings and in a Swedish population sample. *European Addiction Research, 11*, 22-31.

Black, D. W., Blum, N., Pfohl, B., & Hale, N. (2004). Suicidal behavior in borderline personality disorder: Prevalence, risk factors, prediction, and prevention. *Journal of Personality Disorders, 18,* 226-239.

Blais, M. A., Lenderking, W. R., Baer, L., deLorell, A., Peets, K., Leahy, L., & Burns, C. (1999). Development and initial validation of a brief mental health outcome measure. *Journal of Personality Assessment, 73,* 359-373.

Blaszczynski, A., & Steel, Z. (1998). Personality disorders among pathological gamblers. *Journal of Gambling Studies, 14,* 51–71.

Brown, S. A. (2009). Personality and non-suicidal deliberate self-harm: Trait differences among a non-clinical population. *Psychiatry Research, 169,* 28-32.

Brown, M., Allen, J. S., & Dowling, N. A. (2014). The application of an etiological model of personality disorders to problem gambling. *Journal of Gambling Studies,* 1-21.

Bornstein, R. F. (2001). A meta-analysis of the dependency-eating-disorders relationship: Strength, specificity, and temporal stability. *Journal of Psychopathology and Behavioral Assessment, 23,* 151-162.

Bruininks R. H., Woodcock R. W., Weatherman R. F., & Hill B. K. (1996). *Scales of Independent Behavior–Revised: Manual.* Riverside Publishing Company, Boston, MA.

Carpenter, R. W., & Trull, T. J. (2013). Components of Emotion Dysregulation in Borderline Personality Disorder: A Review. *Current Psychiatry Reports, 15,* 335-348.

Cassin, S. E., & von Ranson, K. M. (2005). Personality and eating disorders: A decade in review. *Clinical Psychology Review, 25,* 895-916.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1,* 245-276.

Cellar, D. F., Nelson, Z. C., & Yorke, C. M. (2000). The five-factor model and driving behavior: Personality and involvement in vehicular accidents. *Psychological Reports, 86,* 454-456.

Christo, G., Jones, S. L., Haylett, S., Lefever, R. M., & Lefever, R. (2003). The shorter PROMIS questionnaire: Further validation of a tool for simultaneous assessment of multiple addictive behaviors. *Addictive Behaviors, 28,* 225-248.

Claes, L., Vandereycken, W., & Vertommen, H. (2005). Impulsivity-related traits in eating disorder patients. *Personality and Individual Differences, 39,* 739-749.

Clark, L. A. (2007). Assessment and diagnosis of personality disorder: Perennial issues and an emerging reconceptualization. *Annual Review of Psychology, 58,* 227-257.

Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7,* 309-319.

Cloutier, P., Martin, J., Kennedy, A., Nixon M. K., & Muehlenkamp, J. J. (2010). Characteristics and co-occurrence of adolescent non-suicidal self-injury and suicidal behaviors in pediatric emergency crisis services. *Journal of Youth and Adolescence, 39,* 259-269.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: A motivational model of alcohol use. *Journal of Personality and Social Psychology, 69*, 990-1005.

Cooper, M. L., Wood, P. K., Orcutt, H. K., & Albino, A. (2003). Personality and the predisposition to engage in risky or problem behaviors during adolescence. *Journal of Personality and Social Psychology, 84,* 390-410.

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.

Crowell, S. E., Beauchaine, T. P., & Linehan, M. M. (2009). A Biosocial Developmental Model of Borderline Personality: Elaborating and Extending Linehan's Theory. *Psychological Bulletin, 135*, 495–510.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*, 349-354.

Cyders, M. A., Littlefield, A. K., Coffey, S., & Karyadi, K. A. (2014). Examination of a short English version of the UPPS-P Impulsive Behavior Scale. *Addictive Behaviors, 39,* 1372-1376.

Cyders, M. A., & Smith, G. T. (2008). Clarifying the role of personality dispositions in risk for increased gambling behavior. *Personality and Individual Differences, 45,* 503-508.

Cyders, M. A., Smith, G. T., Spillane, N. S., Fischer, S., Annus, A. M., & Peterson, C. (2007). Integration of impulsivity and positive mood to predict risky behavior:

Development and validation of a measure of positive urgency. *Psychological Assessment, 19,* 107-118.

Dahlen, E. R., & White, R. P. (2006). The big five factors, sensation seeking, and driving anger in the prediction of unsafe driving. *Personality and Individual Differences, 41,* 903-915.

Deckman, T., & DeWall, C. N. (2011). Negative urgency and risky sexual behaviors: A clarification of the relationship between impulsivity and risky sexual behavior. *Personality and Individual Differences, 51,* 674-678.

DeHart, D. D., & Birkimer, J. C. (1997). Trying to practice safer sex: Development of the sexual risks scale. *The Journal of Sex Research, 34,* 11-25.

Desai, R. A., & Potenza, M. N. (2008). Gender differences in the associations between past-year gambling problems and psychiatric disorders. *Social Psychiatry and Psychiatric Epidemiology, 43,* 173–183.

DeShong, H. L., Helle, A. C., & Mullins-Sweatt, S. N. (in preparation). Maladaptive Behavior Scale.

DeShong, H. L., Lengel, G. J., Sauer-Zavala, S. E., O'Meara, M., & Mullins-Sweatt, S. N. (2015). Construct validity of the five factor borderline inventory. *Assessment, 22,* 319-331.

Dir, A. L., Karyadi, K., & Cyders, M. A. (2013). The uniqueness of negative urgency as a common risk factor for self-harm behaviors, alcohol consumptions, and eating problems. *Addictive Behaviors, 38,* 2158-2162.

Dula, C. S., & Ballard, M. E. (2003). Development and evaluation of a measure of dangerous, aggressive, negative emotional, and risky driving. *Journal of Applied Social Psychology, 33*, 263-282.

Edwards, E. A. (1993). Development of a new scale for measuring compulsive buying behavior. *Financial Counseling and Planning, 4*, 67-85.

Elfhag, K., & Morey, L. C. (2008). Personality traits and eating behavior in the obese: Poor self-control in emotional and external eating but personality assets in restrained eating. *Eating Behaviors, 9*, 285-293.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*, 272-299.

Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16,* 363-370.

Fairburn, C. G., & Beglin, S. J. (2008). Eating disorder examination questionnaire (EDE-Q 6.0) In Fairburn C.G. (Ed.). *Cognitive behavior therapy and eating disorders*. Guilford Press, New York.

Fairburn, C. G., & Cooper, Z. (1993). The Eating Disorder Examination (12th ed.). In C. G. Fairburn & G. T. Wilson (Eds.), *Binge Eating: Nature, Assessment, and Treatment* (pp. 314-360). New York: Guilford Press.

Feitosa, J., Joseph, D. L., & Newman, D. A. (2015). Crowdsourcing and personality measurement equivalence: A warning about countries whose primary language is not English. *Personality and Individual Differences, 75*, 47-52.

Fischer, S., Settles, R., Collins, B., Gunn, R., & Smith, G. T. (2012). The role of negative urgency and expectancies in problem drinking and disordered eating: Testing a model of comorbidity in pathological and at-risk samples. *Psychology of Addictive Behavior, 26,* 112-123.

Fischer, S., & Smith, G. T. (2004). Deliberation affects risk taking beyond sensation seeking. *Personality and Individual Differences, 36*, 527-537.

Fischer, S., Smith, G. T., & Cyders, M. A. (2008). Another look at impulsivity: A meta-analytic review comparing specific dispositions to rash action in their relationship to bulimic symptoms. *Clinical Psychology Review*, *28*, 1413-1425.

Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment, 7*, 286-299.

Flory, K., Lynam, D., Milich, R., Leukefeld, C., & Clayton, R. (2002). The relations among personality, symptoms of alcohol and marijuana abuse, and symptoms of comorbid psychopathology: Results from a community sample. *Experimental and Clinical Psychopharmacology, 10*, 425-434.

Glenn, C. R., & Klonsky, D. (2010). A multimethod analysis of impulsivity in nonsuicidal self-injury. *Personality Disorders: Theory, Research, and Treatment, 1*, 67-75.

Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.

Grant, J. E., & Kim, S. W. (2002). An open-label study of naltrexone in the treatment of kleptomania. *Journal of Clinical Psychiatry, 63,* 349-356.

Gunderson, J. G., & Ridolfi, M. E. (2001). Borderline personality disorder: Suicidality and self-mutilation. *Annual NY Academy of Science, 932,* 61-73.

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 30,* 179-185.

Horton, J. J., & Chilton, L. B. (2010, June 7-11), *The labor economics of paid crowdsourcing*. ACM Conference on Electronic Commerce, Boston, USA, pp. 209-218.

Hoyle, R. H., Fejfar, M. C., & Miller, J. D. (2000). Personality and sexual risk taking: A quantitative review. *Journal of Personality, 68,* 1203-1231.

Jennison, K. M. (2004). The short-term effects and unintended long-term consequences of binge drinking in college: A 10-year follow-up study. *The American Journal of Drug and Alcohol Abuse, 30,* 659-684.

Joiner, T. E., Alfano, M. S., & Metalsky, G. I. (1992). When depression breeds contempt: Reassurance-seeking, self-esteem, and rejection breeds contempt: Reassurance-seeking, self-esteem, and rejection of depressed college students by their roommates. *Journal of Abnormal Psychology, 101,* 165-173.

Jolliffe, D. (2013). Exploring the relationship between the five-factor model of personality, social factors and self-reported delinquency. *Personality and Individual Differences, 55,* 47-52.

Jones, S. E., Miller, J. D. & Lynam, D. R. (2011). Personality, antisocial behavior, and aggression: A meta-analytic review. *Journal of Criminal Justice, 39,* 329-337.

Kaiser, A. J., Milich, R., Lynam, D. R., & Charnigo, R. J. (2012). Negative Urgency, Distress Tolerance, and Substance Abuse Among College Students. *Addictive Behaviors, 37,* 1075–1083.

Kaiser, H. 1974. An index of factor simplicity. *Psychometrika, 39,* 31–36.

Kingston, J., Clarke, S., Ritchie, T., & Remington, B. (2011). Developing and validating the "composite measure of problem behaviors". *Journal of Clinical Psychology, 67,* 1-16.

Klonsky, E. D. (2007). The functions of deliberate self-injury: A review of the evidence. *Clinical Psychology Review, 27,* 226-239.

Klonsky, E. D., & Glenn, C. R. (2009). Assessing the functions of non-suicidal self-injury: Psychometric properties of the Inventory of Statements About Self-injury (ISAS). Journal of Psychopathology and Behavioral Assessment, 31(3), 215-219.

Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2013). The Personality Inventory for DSM-5-Adult Version. *American Psychiatric Association*. Retrieved from http://www.psychiatry.org/file%20library/practice/dsm/dsm-5/thepersonalityinventoryfordsm5fullversionadult.pdf

Kushner, M. G., Abrams, K., & Borchardt, C. (2000). The relationship between anxiety disorders and alcohol use disorders: A review of major perspectives and findings. *Clinical Psychology Review, 20,* 149-171.

Lesieur, H. R., & Blume, S. B. (1993). Revising the South Oaks Gambling Screen in different settings. *Journal of Gambling Studies, 9,* 213–223.

Lejoyeux, M., Feuche, N., Loi, S., Solomon, J., & Ades, J. (1998). Impulse-control disorders in alcoholics are related to sensation seeking and not to impulsivity. *Psychiatry Research, 81*, 149– 155.

Linehan, M. M. (1993). *Cognitive-Behavioral Treatment of Borderline Personality Disorder*. New York: Guilford.

Luce, K. H., & Crowther, J. H. (1999). The reliability of the eating disorder examination—self report questionnaire version (EDE-Q). *International Journal of Eating Disorders, 25*, 349-351.

Lynam, D. R., Smith, G.T., Whiteside, S. P., & Cyders, M. A. (2006). The UPPS-P: Assessing five personality pathways to impulsive behavior. Technical report. West Lafayette, IN: Purdue University; 2006.

Lynam, D. R. (2013). Development of a short form of the UPPS-P Impulsive Behavior Scale. Unpublished Technical Report.

Lynam, D. R., Miller, J. D., Miller, D. J., Bornovalova, M. A., & Lejuez, C. W. (2011). Testing the relations between impulsivity-related traits, suicidality, and nonsuicidal self-injury: A test of the incremental validity of the UPPS model. *Personality Disorders: Theory, Research, and Treatment*, *2*(2), 151-160.

Lynam, D. R., & Widiger, T. A. (2007). Using a general model of personality to identify the basic elements of psychopathy. *Journal of Personality Disorders, 21*, 160-178.

Lynam, D., Gaughan, E., Miller, J. D., Miller, D. J., Mullins-Sweatt, S., & Widiger, T. A. (2011). Assessing the basic traits associated with psychopathy: Development and validation of the Elemental Psychopathy Assessment. *Psychological Assessment, 23*, 108-124.

Maples, J. L., Guan, L., Carter, N. T., & Miller, J. D. (2014). A test of the international personality item pool representation of the Revised NEO Personality Inventory and development of a 120-item IPIP-based measure of the Five Factor Model. *Psychological Assessment, 26,* 1070-1084.

McCrae, R. R., & Costa, P. T. (1983). Social desirability scales: More substance than style. *Journal of Consulting and Clinical Psychology, 51,* 882-888.

Messman-Moore, T. L., Walsh, K. L., & DiLillo, D. (2010). Emotion dysregulation and risky sexual behavior in revictimization. *Child Abuse & Neglect*, *34*, 967–976.

Miller, J. D., Lynam, D., & Jones, S. (2008). Externalizing behavior through the lens of the five-factor model: A focus on agreeableness and conscientiousness. *Journal of Personality Assessment, 90,* 158-164.

Miller, J. D., Lynam, D., Zimmerman, R. S., Logan, T. K., Leukefeld, C., & Clayton, R. (2004). The utility of the five factor model in understanding risky sexual behavior. *Personality and Individual Differences, 36,* 1611-1626.

Miller, J. D., Zeichner, A., & Wilson, L. F. (2012). Personality correlates of aggression: Evidence from measures of the five-factor model, UPPS model of impulsivity, and BIS/BAS. *Journal of Interpersonal Violence, 27,* 2903-2919.

Morgan, J. F., Reid, F., & Lacey, J. H. (2000). The SCOFF questionnaire: a new screening tool for eating disorders. *Western Journal of Medicine, 172,* 164.

Mullins-Sweatt, S. N., Jamerson, J. E., Samuel, D. B., Olson, D. R., & Widiger, T. A. (2006). Psychometric properties of an abbreviated instrument of the five-factor model. *Assessment, 13,* 119-137.

Mullins-Sweatt, S. N., Lengel, G. J., & Grant, D. M. (2013). Non-suicidal self-injury: The contribution of general personality functioning. *Personality and Mental Health, 7,* 56-68.

Mullins-Sweatt, S. N., & Widiger, T. A. (2006). The five-factor model of personality disorder: A translation across science and practice. In R. F. Krueger & J. L. Tackett (Eds.), *Personality and Psychopathology* (pp. 39-70). NY: Guildford Publications.

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100,* 555-561.

Oldham, J. M. (2006). Borderline personality disorder and suicidality. *American Journal of Psychiatry, 163,* 20-26.

Oldham, J. M., Gabbard, G. O., Goin, M. K., Gunderson, J., Soloff, P., Spiegel, D., & …Phillips, K. A. (2001). Practice guideline for the treatment of patients with borderline personality disorder. *American Psychiatric Association*. Retrieved from http://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/bpd.pdf

Osman, A., Bagge, C. L., Gutierrez, P. M., Konick, L. C., Kopper, B. A., & Barrios, F. X. (2001). The Suicidal Behaviors Questionnaire-Revised (SBQ-R): validation with clinical and nonclinical samples. *Assessment, 8*(4), 443-454.

Paolacci, G., Chandler, J., & Ipeirotis, P. G. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and Decision Making, 5*, 411-419.

Raine, A., Dodge, K., Loeber, R., Gatzke-Kopp, L., Lynam, D., Reynolds, C., Stouthamer- Loeber, M., & Liu, J. (2006). The reactive–proactive aggression

questionnaire: Differential correlates of reactive and proactive aggression in adolescent boys. *Aggressive Behavior, 32,* 159–171.

Raynor, D. A., & Levine, H. (2009). Associations between the five-factor model of personality and health behaviors among college students. *Journal of American College Health, 58,* 73-82.

Renner, W., Anderle, F. (2000). Venturesomeness and extraversion as correlates of juvenile drivers' traffic violations. *Accident Analysis and Prevention, 32,* 673-678.

Ridgway, N. M., Kukar-Kinney, M., & Monroe, K. B. (2008). An expanded conceptualization and a new measure of compulsive buying. Journal of Consumer Research, 35, 622-639.

Rosotto, E., Yager, J., & Rorty, M. (1998). The impulsive behavior scale. In J. Vanderlinden, & W. Vandereycken (Eds.), *Trauma, dissociation, and impulsive dyscontrol in eating disorders.* Brunner/Mazel.

Ruiz, M. A., Pincus, A. L., & Schinka, J. A., (2008). Externalizing pathology and the five-factor model: A meta-analysis of personality traits associated with antisocial personality disorder, substance use disorder, and their co-occurrence. *Journal of Personality Disorders, 22,* 365-388.

Samuel, D. B., & Widiger, T. A. (2008). A meta-analytic review of the relationships between the five-factor model and DSM-IV-TR personality disorders: A facet level analysis. *Clinical Psychology Review, 28,* 1326-1342.

Saulsman, L. M., & Page, A. C. (2004). The five-factor model and personality disorder empirical literature: A meta-analytic review. *Clinical Psychology Review, 23,* 1055-1085.

Saunders, J. B., Aasland, O. G., Babor, T. F., …et al. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addition, 88,* 791-803.

Selby, E. A., & Joiner, T. E. (2009). Cascades of emotion: The emergence of borderline personality disorder from emotional and behavioral dysregulation. *Review of General Psychology, 13,* 219-238.

Simms, L. J., & Watson, D. (2007). The construct validation approach to personality scale construction. In R.W. Robins, R.C. Fraley, & R.F. Krueger (Eds.), *Handbook of Research Methods in Personality Psychology* (pp. 240-258). New York, New York: Guilford Press.

Skodol, A. E., Oldham, J. M., & Gallaher, P. E. (1999). Axis II comorbidity of substance use disorders among patients referred for treatment of personality disorders. *The American Journal of Psychiatry, 5,* 733-738.

Smith, G. T., Fischer, S., Cyders, M. A., Annus, A. M., Spillane, N. S., & McCarthy, D. M. (in press). On the validity and utility of discriminating among impulsivity-like traits. *Assessment, 14,* 155-170.

Sparrow, S. S., Balla, D.A. & Cicchetti, D. V. (1984). *Vineland Adaptive Behavior Scales: Survey form Manual.* Circle Pines, MN: American Guidance Service.

Stevens, J. P. (2009). Applied multivariate statistics for the social sciences (5th ed.). New York, NY: Routledge.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Needham Heights, MA: Allyn & Bacon.

Trull, T. J., Sher, K. J., Minks-Brown, C., Durbin, J., & Burr, R. (2000). Borderline personality disorder and substance use disorders: A review and integration. *Clinical Psychology Review, 20*, 235-253.

Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika, 41*, 321-327.

Waldman, I. D., & Slutske, W. S. (2000). Antisocial behavior and alcoholism: A behavioral genetic perspective on comorbidity. *Clinical Psychology Review, 20,* 255-287.

Weiss, N. H., Tull, M. T., Viana, A. G., Anestis, M. D., & Gratz, K. L. (2012). Examining associations between PTSD, emotion dysregulation, and impulsive behaviors among substance dependent inpatients. *Journal of Anxiety Disorders, 26,* 453-458.

Whiteside, U., Chen, E., Neighbors, C., Hunter, D., Lo, T., & Larimer, M. (2007). Difficulties regulating emotions: Do binge eaters have fewer strategies to modulate and tolerate negative affect? *Eating Behaviors, 8,* 162–169.

Whiteside, S. P., & Lynam, D. R. (2001). The Five Factor Model and impulsivity: using a structural model of personality to understand impulsivity. *Personality and Individual Differences, 30*, 669-689.

Whiteside, S. P., & Lynam, D. R. (2003). Understanding the role of impulsivity and externalizing psychopathology in alcohol abuse: Application of the UPPS impulsive behavior scale. *Experimental and Clinical Psychopharmacology, 11,* 210-217.

# APPENDICES

# APPENDIX A

## TABLES

Table 1. Descriptive Statistics and Internal Consistency of Original and Revised MBS Items

| | Original MBS | | | Revised MBS |
|---|---|---|---|---|
| | S1 | S2 | Item | S3 |
| Description | M (SD) | M (SD) | rev. | M (SD) |
| Substance | $\alpha = 0.578$ | $\alpha = 0.719$ | | $\alpha = 0.749$ |
| Illicit/prescription drug use | 0.41(0.92) | 0.26(0.76) | R | 0.24(0.81) |
| Consuming too much alcohol | 0.54(0.78) | 0.48(0.77) | R | 0.35(0.76) |
| Driving under the influence | 0.25(0.68) | 0.19(0.60) | — | 0.19(0.69) |
| Problems with marijuana use | 0.09(0.54) | 0.09(0.45) | D | |
| Marijuana interfered with functioning | | | N | 0.26(0.76) |
| Substance use related impairment | | | N | 0.19(0.71) |
| Sexual Impulsivity | $\alpha = 0.571$ | $\alpha = 0.665$ | | $\alpha = 0.743$ |
| One night stand | 0.17(0.52) | 0.16(0.51) | — | 0.11(0.49) |
| Multiple sexual partners | | | N | 0.10(0.42) |
| Sex with person involved with someone else | 0.16(0.47) | 0.08(0.40) | — | 0.09(0.39) |
| Sex with someone you didn't want to | 0.04(0.20) | 0.05(0.31) | R | 0.05(0.31) |
| Unsafe sex | 0.32(0.78) | 0.42(0.90) | R | 0.37(0.97) |
| Self-harm/Suicide | $\alpha = 0.506$ | $\alpha = 0.899$ | | $\alpha = 0.723$ |
| Nonsuicidal self-injury | 0.08(0.36) | 0.06(0.29) | R | 0.15(0.59) |
| NSSI requiring treatment/hospitalization | 0.02(0.14) | 0.02(0.23) | — | 0.08(0.45) |
| Attempted suicide | 0.02(0.14) | 0.03(0.28) | — | 0.03(0.23) |
| Maladaptive Eating | $\alpha = 0.290$ | $\alpha = 0.450$ | | $\alpha = 0.613$ |
| Binging | 0.55(0.90) | 0.46(0.83) | R | 0.42(0.75) |
| Fasting for non-religious/medical reasons | 0.13(0.42) | 0.11(0.40) | — | 0.19(0.63) |
| Purging | 0.07(0.34) | 0.08(0.37) | — | 0.09(0.46) |
| Abusing laxatives/diet pills | 0.01(0.10) | 0.04(0.25) | R | 0.10(0.50) |
| Impulsive Stealing | $\alpha = 0.661$ | $\alpha = 0.565$ | | $\alpha = 0.833$ |
| Eat food in store before paying | 0.16(0.46) | 0.10(0.36) | R | 0.04(0.27) |
| Stealing food | 0.10(0.47) | 0.03(0.23) | — | 0.06(0.38) |
| Stealing from store or vendor | 0.05(0.36) | 0.04(0.21) | R | 0.07(0.39) |
| Stealing from acquaintances/friends/family | 0.04(0.24) | 0.04(0.27) | — | 0.06(0.39) |
| Impulsive Driving | $\alpha = 0.292$ | $\alpha = 0.350$ | | $\alpha = 0.611$ |
| Reckless driving | 0.39(0.79) | 0.49(0.88) | — | 0.32(0.79) |
| Received speeding ticket | 0.16(0.42) | 0.14(0.37) | — | 0.10(0.45) |
| Texted/social media while driving | 1.30(1.36) | 1.81(1.39) | D | |
| Impulsive Spending | $\alpha = 0.669$ | $\alpha = 0.180$ | | $\alpha = 0.651$ |
| Impulsive spending | 0.84(0.99) | 0.72(0.84) | R | 0.46(0.78) |
| Gambling more than intended | 0.30(0.81) | 0.07(0.31) | — | 0.21(0.58) |
| Betting more than can afford to lose | 0.21(0.69) | 0.04(0.24) | R | 0.20(0.64) |
| Aggression | $\alpha = 0.661$ | $\alpha = 0.283$ | | $\alpha = 0.634$ |
| Argued with close friend/family | 0.84(0.90) | 0.75(0.85) | — | 0.67(0.90) |
| Hurt someone | 0.15(0.56) | 0.11(0.37) | R | 0.11(0.55) |
| Thrown objects during argument | 0.17(0.55) | 0.07(0.26) | R | 0.12(0.47) |
| Vandalism | 0.04(0.24) | 0.02(0.14) | R | 0.06(0.33) |
| **Total Scale Score** | $\alpha = 0.748$ | $\alpha = 0.801$ | | $\alpha = 0.919$ |
| | 7.37(6.08) | 6.85(6.10) | | 4.99(9.07) |

*Note*. Item Rev. = Item revision status, where: "R" = Revised item; "D" = Deleted Item; "N" = New item; "—" = No change to item. S3 = Revised item MBS Means and SD. For original item descriptive statistics in S3, see Table 2 (comparison of items).

Table 2. Original and Revised MBS Items and Revision Status

| # | Original | Item rev. | # | Revision |
|---|---|---|---|---|
| 1 | Used illicit drugs or misused prescription drugs? | R | 1 | Used illicit drugs (e.g., meth, cocaine, ecstasy, inhalants, PCP) or misused prescription drugs? |
| 2 | Consumed too much alcohol for your own good? | R | 2 | Consumed too much alcohol for your own good or engaged in binge drinking? |
| 3 | Driven under the influence of drugs and/or alcohol? | — | 3 | Driven under the influence of drugs and/or alcohol? |
| 4 | Had problems related to your marijuana use? | D | | |
| | | N | 4 | Used marijuana to the point that you weren't engaging in other activities? |
| | | N | 5 | Had problems related to your substance use? |
| 5 | Had a one-night stand? | — | 6 | Had a one-night stand? |
| | | N | 7 | Had multiple sexual partners? |
| 6 | Had sex with someone who was involved with someone else? | — | 8 | Had sex with someone who was involved with someone else? |
| 7 | Had sex with someone you didn't want to have sex with? | R | 9 | Had sex with someone you didn't want to have sex with or engaged in sexual activity you weren't confortable with? |
| 8 | Engaged in unsafe sex? | R | 10 | Engaged in unsafe sex (e.g., failed to use contraceptives to prevent STDs or pregnancy)? |
| 9 | Hurt yourself on purpose (e.g., cutting, scratching, burning)? | R | 11 | Hurt yourself on purpose (e.g., pinching, biting, cutting, scratching, burning) without intending to kill yourself? |
| 10 | Hurt yourself on purpose severely enough to require medical treatment or hospitalization? | — | 12 | Hurt yourself on purpose severely enough to require medical treatment or hospitalization? |
| 11 | Attempted suicide? | — | 13 | Attempted suicide? |
| 12 | Binged on large amounts of food? | R | 14 | Binged on unusually large amounts of food? |
| 13 | Fasted an entire day for nonreligious and/or nonmedical reasons? | — | 15 | Fasted an entire day for nonreligious and/or nonmedical reasons? |
| 14 | Forced yourself to vomit? | — | 16 | Forced yourself to vomit? |
| 15 | Abused laxatives, diuretics, or diet pills? | R | 17 | Misused laxatives, diuretics, or diet pills? |
| 16 | Eaten food in the grocery store before paying for it? | R | 18 | Eaten food in the grocery store without paying for it? |
| 17 | Stolen food? | — | 19 | Stolen food? |
| 18 | Stolen material goods (such as clothes or jewelry) from a store or vendor? | R | 20 | Stolen material goods (e.g., clothing, electronics, or jewelry) from a store or vendor? |

| | | | | |
|---|---|---|---|---|
| 19 | Stolen personal items or money from acquaintances, friends, or family? | — | 21 | Stolen personal items or money from acquaintances, friends, or family? |
| 20 | Driven recklessly? | — | 22 | Driven recklessly? |
| 21 | Received a speeding ticket? | — | 23 | Received a speeding ticket? |
| 22 | Texted or used social media/internet while driving? | D | | |
| 23 | Impulsively spent money on clothes, jewelry, or other items? | R | 24 | Impulsively spent money on clothing, electronics, jewelry, or other items? |
| 24 | Gambled more than you intended? | — | 25 | Gambled more than you intended? |
| 25 | Bet more money than you could really afford to lose? | R | 26 | Bet more money than you could afford to lose? |
| 26 | Got into an argument with a close friend or family member? | — | 27 | Got into an argument with a close friend or family member? |
| 27 | Physically hit someone? | R | 28 | Intentionally hurt another person (e.g., hit, kicked, slapped, punched, pulled hair)? |
| 28 | Thrown objects during a fight or argument? | R | 29 | During or following a fight or argument, thrown objects, punched a wall or mirror, etc.? |
| 29 | Vandalized school or private property? | R | 30 | Vandalized school, public or private property? |

*Note*. Item Rev. = Item revision status, where: "R" = Revised item; "D" = Deleted Item; "N" = New item; "—" = No change to item.

Table 3. Descriptive Statistics of Personality Variables across all Samples

| | S1 | | S2 | | S3 | |
|---|---|---|---|---|---|---|
| | $\alpha$ | M (SD) | $\alpha$ | M (SD) | $\alpha$ | M (SD) |
| **General Personality**[1] | | | | | | |
| Neuroticism | 0.79 | 13.89(4.71) | 0.88 | 65.37(14.65) | 0.95 | 59.03(22.84) |
| Anxiousness | | 2.67(1.23) | | 13.38(3.85) | | 11.51(5.23) |
| Angry Hostility | | 2.05(1.05) | | 11.14(4.00) | | 10.23(4.79) |
| Depressiveness | | 2.24(1.14) | | 9.21(3.97) | | 8.93(5.13) |
| Self consciousness | | 2.65(1.22) | | 10.93(3.18) | | 10.14(3.75) |
| Impulsivity | | 2.29(1.03) | | 11.17(3.27) | | 9.80(4.25) |
| Vulnerability | | 2.02(1.07) | | 9.56(3.17) | | 8.50(4.06) |
| Extraversion | 0.79 | 20.40(4.69) | 0.89 | 87.08(13.90) | 0.92 | 76.76(17.39) |
| Warmth | | 3.68(1.10) | | 15.25(3.26) | | 14.07(4.62) |
| Gregariousness | | 3.43(1.22) | | 12.16(4.50) | | 10.03(4.52) |
| Assertiveness | | 3.01(1.02) | | 14.29(3.34) | | 13.13(4.11) |
| Activity | | 3.56(1.07) | | 14.60(3.02) | | 14.02(3.71) |
| Excitement Seeking | | 2.97(1.21) | | 14.39(2.95) | | 11.34(3.68) |
| Positive Emotions | | 3.76(1.12) | | 16.33(2.87) | | 15.13(3.26) |
| Agreeableness | 0.79 | 21.55(4.39) | 0.85 | 87.99(12.33) | 0.90 | 92.36(15.27) |
| Trust | | 3.33(1.15) | | 13.92(3.47) | | 13.71(4.35) |
| Straightforwardness | | 3.89(0.97) | | 14.40(3.24) | | 15.54(3.65) |
| Altruism | | 3.74(0.98) | | 16.80(2.65) | | 16.96(3.17) |
| Compliance | | 3.52(1.05) | | 15.31(3.45) | | 16.37(3.70) |
| Modesty | | 3.53(1.03) | | 12.91(3.30) | | 14.11(3.66) |
| Tendermindedness | | 3.57(1.07) | | 14.52(3.10) | | 15.73(3.56) |
| Conscientiousness | 0.84 | 22.91(4.37) | 0.89 | 88.55(13.46) | 0.93 | 96.40(16.50) |
| Competence | | 3.83(0.94) | | 16.06(2.69) | | 16.77(3.07) |
| Order | | 3.72(1.02) | | 14.26(3.22) | | 15.28(3.91) |
| Dutifulness | | 3.94(0.94) | | 16.60(2.67) | | 17.24(2.65) |
| Achievement Striving | | 3.90(1.01) | | 16.17(2.81) | | 16.15(2.94) |
| Self-discipline | | 3.82(0.97) | | 12.32(3.60) | | 14.61(4.27) |
| Deliberation | | 3.70(0.97) | | 12.90(3.86) | | 15.78(4.14) |
| Openness to Experience | 0.76 | 20.12(4.38) | 0.75 | 74.30(10.95) | 0.84 | 79.57(14.94) |
| Fantasy | | 2.97(1.18) | | 14.07(3.22) | | 13.38(3.92) |
| Aesthetics | | 3.27(1.05) | | 14.00(3.43) | | 15.24(3.65) |
| Feelings | | 3.93(0.97) | | 13.02(3.51) | | 13.45(4.19) |
| Actions | | 3.05(1.10) | | 10.33(3.02) | | 10.55(3.96) |
| Ideas | | 3.38(1.05) | | 13.94(3.35) | | 14.91(4.71) |
| Values | | 3.49(1.17) | | 8.90(3.88) | | 11.53(4.62) |
| **Impulsivity**[2] | | | | | | |
| Negative Urgency | 0.79 | 8.67(3.06) | 0.89 | 25.86(7.39) | 0.91 | 23.46(8.01) |
| Lack of Perseverance | 0.62 | 6.36(1.81) | 0.84 | 19.57(5.14) | 0.89 | 17.48(5.88) |
| Lack of Premed. | 0.76 | 6.44(2.06) | 0.87 | 21.85(5.91) | 0.88 | 18.99(5.84) |
| Sensation Seeking | 0.65 | 10.49(2.91) | 0.86 | 32.97(7.55) | 0.89 | 25.15(8.45) |
| Positive Urgency | 0.78 | 7.71(2.86) | 0.94 | 25.84(8.95) | 0.94 | 22.16(8.36) |

*Note*. S1 = community; S2 = college students; S3 = Mturk. [1]General Personality was assessed with different measures (S1 = FFMRF; S2 & S3 = IPIP NEO-120), therefore the means are not on the same scale. [2]Impulsivity: S1 = SUPPS-P; S2 & S3 = UPPS-P.

Table 4. Convergent Validity (Personality) across all Samples

| | S1 | S2 | S3 |
|---|---|---|---|
| | MBS | MBS | MBS-R |
| **General Personality**[1] | | | |
| Neuroticism | **0.26*** | **0.19*** | **0.27*** |
| Anxiousness | 0.21 | 0.03 | 0.16 |
| Angry Hostility | 0.22 | **0.23*** | **0.30*** |
| Depressiveness | 0.12 | 0.13 | **0.27*** |
| Self consciousness | 0.09 | -0.05 | 0.15 |
| Impulsivity | **0.29*** | **0.29*** | 0.24 |
| Vulnerability | 0.12 | 0.12 | 0.15 |
| Extraversion | 0.13 | 0.04 | 0.04 |
| Warmth | 0.11 | -0.006 | -0.003 |
| Gregariousness | 0.11 | 0.14 | 0.09 |
| Assertiveness | 0.10 | -0.002 | 0.12 |
| Activity | 0.01 | -0.08 | -0.03 |
| Excitement Seeking | 0.22 | 0.13 | 0.24 |
| Positive Emotions | 0.02 | -0.13 | -0.01 |
| Agreeableness | -0.12 | **-0.34*** | **-0.36*** |
| Trust | -0.09 | -0.14 | -0.15 |
| Straightforwardness | -0.03 | **-0.32*** | **-0.46*** |
| Altruism | -0.00 | **-0.30*** | -0.16 |
| Compliance | -0.12 | **-0.31*** | **-0.42*** |
| Modesty | -0.08 | -0.05 | **-0.29*** |
| Tendermindedness | -0.14 | **-0.20*** | -0.10 |
| Conscientiousness | -0.02 | **-0.26*** | -0.26 |
| Competence | -0.03 | -0.12 | -0.11 |
| Order | -0.01 | -0.07 | -0.22 |
| Dutifulness | -0.05 | **-0.32*** | **-0.27*** |
| Achievement Striving | 0.08 | -0.17 | -0.21 |
| Self-discipline | -0.11 | -0.12 | -0.19 |
| Deliberation | 0.02 | **-0.29*** | **-0.36*** |
| **Impulsivity**[2] | | | |
| Negative Urgency | **0.36*** | **0.33*** | **0.49*** |
| Lack of Perseverance | -0.01 | **0.21*** | 0.18 |
| Lack of Premeditation | 0.14 | **0.23*** | 0.21 |
| Sensation Seeking | 0.14 | 0.15 | **0.38*** |
| Positive Urgency | **0.33*** | **0.27*** | **0.49*** |

*Note*. *$p < .001$. S1 = community; S2 = college students; S3 = Mturk. MBS-R = MBS revised. [1]General Personality: S1 = FFMRF; S2 & S3 = IPIP NEO-120. [2]Impulsivity: S1 = SUPPS-P; S2 & S3 = UPPS-P.

Table 5. Internal Consistency of Behavioral Outcome Measures and Convergence of MBS Original Items with Behavioral Outcomes in Sample 2 (students)

| Maladaptive Behavior Scale | | Behavioral Outcomes | | |
|---|---|---|---|---|
| Item | **Description** | $\alpha$ | Measure | *r* |
| 1 | Used illicit drugs or misused prescription drugs? | 0.86 | DUDIT | **0.57*** |
| 2 | Consumed too much alcohol for your own good? | 0.78 | AUDIT | **0.67*** |
| 3 | Driven under the influence of drugs and/or alcohol? | | DUDIT | **0.42*** |
| 3 | | | AUDIT | **0.34*** |
| 4 | Had problems related to your marijuana use? | 0.81 | CUDIT | **0.72*** |
| 5 | Had a one-night stand? | | SII-Risk | **0.39*** |
| 6 | Had sex with someone who was involved with someone else? | | SII-Risk | **0.27*** |
| 7 | Had sex with someone you didn't want to have sex with? | | SII-Risk | 0.16 |
| 8 | Engaged in unsafe sex? | | SII-Risk | **0.49*** |
| 9 | Hurt yourself on purpose (e.g., cutting, scratching, burning)? | | ISAS Freq. | -0.003 |
| 9 | | | ISAS Sever. | 0.23 |
| 9 | | 0.85 | SBQ-R | **0.28*** |
| 10 | Hurt yourself on purpose severely enough to require medical treatment or hospitalization? | | ISAS Freq. | -0.01 |
| 10 | | | ISAS Sever. | -- |
| 10 | | | SBQ-R | -0.04 |
| 11 | Attempted suicide? | | SBQ-R | -0.02 |
| 12 | Binged on large amounts of food? | 0.96 | EDE Glob | **0.25*** |
| 13 | Fasted an entire day for nonreligious and/or nonmedical reasons? | | EDE Glob | **0.40*** |
| 13 | | 0.84 | EDE Rest. | **0.39*** |
| 14 | Forced yourself to vomit? | | EDE Glob | **0.18*** |
| 15 | Abused laxatives, diuretics, or diet pills? | | EDE Glob | 0.10 |
| 16 | Eaten food in the grocery store before paying for it? | 0.73 | KSAS | 0.08 |
| 17 | Stolen food? | | KSAS | 0.10 |
| 18 | Stolen material goods (such as clothes or jewelry) from a store or vendor? | | KSAS | 0.13 |
| 19 | Stolen personal items or money from acquaintances, friends, or family? | | KSAS | 0.05 |
| 20 | Driven recklessly? | 0.94 | 3DI Total | **0.31*** |
| 20 | | 0.86 | 3DI Neg. | **0.28*** |
| 21 | Received a speeding ticket? | | 3DI Total | 0.12 |
| 21 | | | 3DI Neg. | 0.07 |

| | | | | |
|---|---|---|---|---|
| 22 | Texted or used social media/internet while driving? | | 3DI Total | **0.32*** |
| 22 | | | 3DI Neg. | **0.28*** |
| 23 | Impulsively spent money on clothes, jewelry, or other items? | 0.87 | RCBS | **0.39*** |
| 24 | Gambled more than you intended? | 0.81 | SOGS | **0.59*** |
| 25 | Bet more money than you could really afford to lose? | | SOGS | **0.43*** |
| 26 | Got into an argument with a close friend or family member? | 0.92 | RPQ Total | **0.22*** |
| 26 | | 0.87 | RPQ React. | **0.25*** |
| 27 | Physically hit someone? | | RPQ Total | **0.29*** |
| 27 | | | RPQ React. | **0.30*** |
| 28 | Thrown objects during a fight or argument? | | RPQ Total | **0.19*** |
| 28 | | | RPQ React. | **0.17*** |
| 29 | Vandalized school or private property? | | RPQ Total | **0.23*** |
| 29 | | | RPQ React. | **0.19*** |

*Note*. *$p < .001$. ISAS Freq. = frequency, Sever. = severity; EDE Restr. = Restraint; 3DI Negative = Negative Emptions; RPQ React. = Reactive.

Table 6. Convergence with Behavioral Outcomes in Sample 3 (Mturk)

| Maladaptive Behavior Scale | | Behavioral Outcomes | | |
|---|---|---|---|---|
| Item | **Description** | $\alpha$ | Measure | *r* |
| 1 | Used illicit drugs (e.g., meth, cocaine, ecstasy, inhalants, PCP) or misused prescription drugs? | 0.91 | DUDIT | **0.69*** |
| 2 | Consumed too much alcohol for your own good or engaged in binge drinking? | 0.83 | AUDIT | **0.73*** |
| 3 | Driven under the influence of drugs and/or alcohol? | | DUDIT | **0.36*** |
| 3 | | | AUDIT | **0.36*** |
| 4 | Used marijuana to the point that you weren't engaging in other activities? | 0.78 | CUDIT | 0.44 |
| 5 | Had problems related to your substance use? | | DUDIT | **0.57*** |
| 5 | | | AUDIT | **0.44*** |
| 5 | | | CUDIT | 0.44 |
| 6 | Had a one-night stand? | | SII-Risk | 0.22 |
| 7 | Had multiple sexual partners? | | SII-Risk | **0.27*** |
| 8 | Had sex with someone who was involved with someone else? | | SII-Risk | **0.31*** |
| 9 | Had sex with someone you didn't want to have sex with or engaged in sexual activity you weren't comfortable with? | | SII-Risk | **0.27*** |
| 10 | Engaged in unsafe sex (e.g., failed to use contraceptives to prevent STDs or pregnancy)? | | SII-Risk | **0.37*** |
| 11 | Hurt yourself on purpose (e.g., pinching, biting, cutting, scratching, burning) without intending to kill yourself? | | ISAS Freq. | **0.25*** |
| 11 | | | ISAS Sever. | 0.21 |
| 11 | | 0.81 | SBQ-R | **0.27*** |
| 12 | Hurt yourself on purpose severely enough to require medical treatment or hospitalization? | | ISAS Freq. | -0.03 |
| 12 | | | ISAS Sever. | 0.19 |
| 12 | | | SBQ-R | 0.05 |
| 13 | Attempted suicide? | | SBQ-R | 0.14 |
| 13 | | | ISAS Sever. | 0.20 |
| 14 | Binged on unusually large amounts of food? | 0.96 | EDE Global | **0.43*** |
| 15 | Fasted an entire day for nonreligious and/or nonmedical reasons? | | EDE Global | 0.23 |
| 15 | | 0.88 | EDE Restr. | **0.29*** |
| 16 | Forced yourself to vomit? | | EDE Global | **0.32*** |

| | | | | |
|---|---|---|---|---|
| 17 | Misused laxatives, diuretics, or diet pills? | | EDE Global | **0.28*** |
| 18 | Eaten food in the grocery store without paying for it? | 0.71 | KSAS | **0.31*** |
| 19 | Stolen food? | | KSAS | **0.37*** |
| 20 | Stolen material goods (e.g., clothing, electronics, or jewelry) from a store or vendor? | | KSAS | **0.37*** |
| 21 | Stolen personal items or money from acquaintances, friends, or family? | | KSAS | 0.24 |
| 22 | Driven recklessly? | 0.96 | 3DI Total | **0.53*** |
| 22 | | 0.88 | 3DI Neg. | **0.45*** |
| 23 | Received a speeding ticket? | | 3DI Total | **0.45*** |
| 23 | | | 3DI Neg. | **0.28*** |
| 24 | Impulsively spent money on clothing, electronics, jewelry, or other items? | 0.90 | RCBS | **0.47*** |
| 25 | Gambled more than you intended? | | SOGS | **0.46*** |
| 26 | Bet more money than you could afford to lose? | | SOGS | **0.51*** |
| 27 | Got into an argument with a close friend or family member? | 0.90 | RPQ Total | **0.41*** |
| 27 | | 0.86 | RPQ React. | **0.42*** |
| 28 | Intentionally hurt another person (e.g., hit, kicked, slapped, punched, pulled hair)? | | RPQ Total | **0.31*** |
| 28 | | | RPQ React. | 0.14 |
| 29 | During or following a fight or argument, thrown objects, punched a wall or mirror, etc.? | | RPQ Total | **0.38*** |
| 29 | | | RPQ React. | **0.35*** |
| 30 | Vandalized school, public or private property? | | RPQ Total | **0.28*** |
| 30 | | | RPQ React. | 0.14 |

*Note*. *$p < .001$. MBS-R: MBS Revised. ISAS Freq. = frequency, Sever. = severity; EDE Restr. = Restraint; 3DI Negative = Negative Emptions; RPQ React. = Reactive.

Table 7. Discriminant Validity with General Personality in all three Samples

| | S1 | S2 | S3 |
|---|---|---|---|
| | MBS | MBS | MBS-R |
| **General Personality**[1] | | | |
| Openness to Experience | 0.14 | 0.01 | 0.03 |
| Fantasy | 0.03 | 0.06 | 0.19 |
| Aesthetics | -0.06 | -0.09 | -0.04 |
| Feelings | 0.02 | -0.03 | 0.05 |
| Actions | **0.30*** | 0.04 | -0.01 |
| Ideas | 0.18 | -0.06 | -0.20 |
| Values | 0.14 | 0.06 | -0.01 |

*Note*. *$p$ < .001. S1 = community; S2 = college students; S3 = Mturk. MBS-R = MBS revised.
[1]General Personality: S1=FFMRF; S2 & S3 =IPIP NEO-120.

Table 8. Comparison of original and revised MBS items in Sample 3.

| | Descriptive Statistics *M (SD)* | | Convergent Validity *Pearson r* | | Comparisons[a] | |
|---|---|---|---|---|---|---|
| | Original | Revised | Original | Revised | *z* | *p* |
| Consuming too much alcohol | 0.26(0.61) | 0.35(0.76) | **0.76***[1] | **0.73***[1] | -0.62 | 0.54 |
| Sex with someone you didn't want to | 0.10(0.40) | 0.05(0.31) | **0.25***[2] | **0.27***[2] | 0.20 | 0.84 |
| Non-suicidal self-injury[b] | 0.39(0.81) | 0.15(0.59) | 0.21[3] | **0.25***[3] | 0.19 | 0.85 |
| | | | 0.09[4] | 0.21[4] | 0.54 | 0.59 |
| | | | 0.19[5] | **0.27***[5] | 0.52 | 0.60 |
| Binging | 0.58(0.93) | 0.42(0.75) | **0.46***[6] | **0.43***[6] | -0.31 | 0.76 |
| Abusing laxatives/diet pills | 0.11(0.49) | 0.10(0.50) | **0.28***[6] | **0.28***[6] | 0.01 | 0.99 |
| Betting more than can afford to lose | 0.15(0.54) | 0.20(0.64) | **0.55***[7] | **0.51***[7] | -0.52 | 0.60 |
| Hurt someone | 0.06(0.28) | 0.11(0.55) | **0.41***[8] | **0.31***[8] | -0.91 | 0.36 |
| | | | 0.20[9] | 0.14[9] | -0.49 | 0.62 |
| Thrown objects during argument | 0.12(0.46) | 0.12(0.47) | **0.54***[8] | **0.38***[8] | -1.83 | 0.07 |
| | | | **0.39***[9] | **0.35***[9] | -0.39 | 0.70 |

*Note*. *$p < .001$.

[a]Comparisons: Fisher *r*-to-*z* transformations were utilized to determine statistical significant difference between Pearson *r* correlations.

[b]Regardless of response, the original NSSI item was answered by 44 participants and the revised NSSI item was answered by 172 participants in the Mturk sample.

[1]AUDIT; [2]SII-Risk; [3]ISAS Frequency (all); [4]ISAS severity; [5]SBQ-R; [6]EDE Global; [7]SOGS; [8]RPQ Total; [9]RPQ Reactive.

Table 9. Supplementary Analyses: Convergence of MBS Total Score with PD and General Functioning

| | S1 (MBS) | | S2 (MBS) | | S3 (MBS-R) | |
|---|---|---|---|---|---|---|
| | $\alpha^1$ | *r* | $\alpha$ | *r* | $\alpha$ | *r* |
| **Personality Disorders** | | | | | | |
| Paranoid | | 0.11 | 0.62 | **0.23*** | 0.75 | **0.34*** |
| Schizoid | | 0.12 | 0.66 | **0.17*** | 0.65 | 0.13 |
| Schizotypal | | 0.15 | 0.66 | 0.15 | 0.75 | 0.21 |
| Antisocial | | **0.25*** | 0.62 | **0.44*** | 0.70 | **0.38*** |
| Narcissistic | | 0.21 | 0.61 | **0.21*** | 0.66 | **0.42*** |
| Borderline | | **0.29*** | 0.64 | **0.36*** | 0.76 | **0.44*** |
| Histrionic | | **0.26*** | 0.54 | **0.19*** | 0.52 | **0.36*** |
| Avoidant | | 0.09 | 0.69 | 0.13 | 0.79 | 0.13 |
| Dependent | | 0.11 | 0.73 | **0.19*** | 0.74 | 0.25 |
| Obsessive | | 0.00 | 0.56 | 0.09 | 0.61 | 0.22 |
| Compulsive | | | | | | |
| **General Functioning** | | | | | | |
| SOS-10 | 0.94 | -0.14 | 0.95 | **-0.22*** | 0.95 | -0.14 |

*Note*. *$p < .001$. Personality Disorders: S1=PD Rating Form; S2 & S3 =PDQ-4. [1]$\alpha$ not included for sample 1 due to PD-Rating form format (1 item per PD).

APPENDIX B

# LITERATURE REVIEW

Maladaptive behaviors, such as risky sexual behaviors, alcohol misuse, and self-injury, are often associated with psychopathology, negative health outcomes, and personality traits such as impulsivity. The impact of maladaptive behaviors on one's daily life is costly in terms of interpersonal or occupational impairment and health care costs. For example, nonsuicidal self-injury is associated with negative physical (e.g., tissue damage, infection) and mental health (e.g., anxiety, depression, suicide attempts) outcomes (Brown, 2009; Cloutier et al., 2010). Binge drinking in college has been associated with negative longitudinal outcomes, including reduced educational attainment and lower wages (Jennison, 2004). Due to the significant impact and potential consequences, screening for maladaptive behaviors in various settings would be beneficial. Thus, research focused on related assessments is vital.

## What are Maladaptive Behaviors?

Maladaptive or risky behaviors are actions that pose a health or safety risk (e.g., contracting an STD, substance-related accident) or serve as maladaptive coping strategies with negative outcomes. While there are a wide range of maladaptive behaviors, the current study focuses on behaviors associated with psychopathology, personality, and negative health, safety, and/or legal outcomes. Specifically, the behaviors assessed in this study are commonly associated with borderline personality disorder (BPD). Some include gambling, risky sexual behavior, maladaptive drinking, and binging, restricting, or compensatory eating-related behaviors. While these behaviors may often be considered in reference to personality pathology (e.g., BPD), the current study will examine

maladaptive behaviors more broadly as they relate to dysregulated affect. It should be noted that maladaptive behaviors do not always result in a psychiatric diagnosis (e.g., eating behaviors could be considered maladaptive without meeting diagnostic threshold for a DSM-5 eating disorder).

Maladaptive behaviors may serve as coping behaviors for an individual, such that they serve to regulate distress or provide distraction from other difficulties. For example, one of the most common functions of nonsuicidal self-injury (NSSI) is to regulate one's affect and individuals often report that this coping strategy is highly effective at regulating distress (Klonsky, 2007). Alcohol misuse may serve the function of relieving anxiety (Kushner, Abrams, & Borchardt, 2000). Although maladaptive behaviors may assist an individual in the short-term with coping, the behaviors still may cause other impairment and/or negative outcomes and lead to more psychopathology or increase in symptoms. However, individuals may not have the adaptive coping skills or resources to change their behaviors; thus, one may continue utilizing the behavior as a way to cope. This is consistent with theories of emotion dysregulation that posit the lack of adaptive strategies and surplus of maladaptive behaviors are part of the dysregulation cycle (Carpenter & Trull, 2013). Assessment of these behaviors may provide opportunities to identify individuals lacking in coping skills or experiencing other significant difficulties.

**Measures of Maladaptive Behaviors**

Identifying and screening maladaptive behaviors may alert clinicians and other medical providers to areas of potential behavior change, impairment requiring treatment, or possibly underlying psychopathology. While there are many assessment measures available across behaviors, they tend to assess urges or intentions rather than actual

behaviors, or they narrowly assess one behavior in particular. While these measures are beneficial in a variety of settings and for many purposes, they are often too lengthy and/or indirect for straightforward behavioral screening measures. A brief review of broadband and narrowband behavioral measures will be discussed. More detail regarding narrowband measures included in the validation of the current study is included in the method section (samples 2).

**Broadband Measures**

There are a few broadband measures of problematic/maladaptive behaviors and the primary scales will be described in more detail. The Composite Measure of Problematic Behaviors (CMPB; Kingston et al., 2011) is a 46-item scale assesses behaviors such as drug use, aggression, sexual promiscuity, and excessive internet/computer game use. However, this scale is not strictly behavioral, as it assesses intentions and urges. The CMPB also assesses characteristics (e.g., "It's like me to…"), urges (e.g., "sometimes feel that I need an alcoholic drink" or "feel the urge to intentionally harm myself"), and cognitions (e.g., "be content if I am prevented from exercising for a week").

In addition to the CMPB, there are measures that focus on risky behaviors that are predominantly associated with sensation seeking. These measures tend to include a wide range of excitement-seeking behaviors such as skydiving, skateboarding, and bungee jumping. These behaviors are not necessarily maladaptive, and are not generally associated with negative affect or impulsiveness related to changes in affect. Researchers have developed variations of impulsive behavior scales in order to assess a particular construct of relevance to specific study (e.g., frequency of engaging in risky behaviors

within last year on the Risky Behavior Scale; Fischer & Smith, 2004). However, the purpose of the current study is to develop a measure of problematic/maladaptive behaviors that are associated with impulsivity, affect, and negative outcomes. These behaviors of focus are not solely considered "risk-taking" behaviors. Therefore, while broadband measures of risky sensation-seeking activities are useful, they do not meet the need that is presented in the current study.

The Shorter PROMIS Questionnaire (SPQ; Christo et al., 2003) is a broadband measure of "addictive" behaviors and tendencies, including substance use, food restriction, sex, relationship styles (dominant, submissive), work, exercise, and other behaviors. The SPQ is a 160-item measure designed for use in recovery and rehabilitation treatment programs. While this measure appears to be detailed and fairly comprehensive, it focuses on addiction and does not include the full range of behaviors we wish to assess (e.g., binging, risky sexual behavior). Further, the length of this scale does not lend itself for use as a screening tool.

Finally, there is a subset of maladaptive behavior scales in the literature focusing on/include problematic or maladaptive behaviors associated with intellectual disability and/or autism. Examples of these measures include the Aberrant Behavior Checklist (Aman & Singh, 1986), Scales of Independent Behavior (SIB-R; Bruininks, Woodcock, Weatherman, & Hill, 1996), and the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984). These measures assess different constructs than the behaviors associated with impulsivity and affect as related to the current study. Overall, while existing broadband measures have utility in a variety of settings, a shorter measure that addresses a wide range of behaviors, rather than intentions/urges/cognitions, is warranted.

## Narrowband Measures

While there are many measures available to assess maladaptive behaviors, these tend to be narrowband measures focusing on one specific area. For instance, the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993) is a preferred screening measure to aid in the early detection of maladaptive alcohol use. The AUDIT is a brief screening tool (10 questions), but only assesses one specific domain of behavior. Another example of a narrowband measure of behavior is the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 2008), which assesses disordered eating patterns/behaviors in 38 questions. While such narrowband measures are reliable, valid, and useful in many contexts, they would not be ideal for a wide range assessment of behaviors in a brief time, such as within a routine visit to a primary care doctor.

## Maladaptive Behavior Scale

The development of a brief measure of maladaptive behaviors is warranted based on the limitations of current broadband and narrowband measures. There are advantages of a brief measure of maladaptive behaviors that can still capture a wide set of behaviors. This type of measure may be particularly advantageous for use in medical, psychiatric, and research settings. The Maladaptive Behavior Scale (MBS; DeShong et al., in preparation) was originally developed to assess a wide range of maladaptive behaviors that are commonly present in individuals that experience emotional dysregulation and have BPD or BPD traits.

The first step of the original MBS scale development was to survey the literature to determine maladaptive behaviors commonly associated with BPD, which resulted in nine core areas (substance misuse, risky sex, impulsive spending, stealing, risky driving,

reassurance seeking, physical aggression, nonsuicidal self-injury/suicide, binging/purging). For example, impulsive behaviors listed in the DSM-5 Borderline Personality Disorder criterion 4 ("impulsivity in at least two areas that are potentially self-damaging (e.g., spending, sex, substance use, reckless driving, binge eating") and criterion 5 ("recurrent suicidal behavior, gestures, or threats, or self-mutilating behavior"; APA, 2013, p. 663) were included in the MBS. The scale was then developed by creating and adapting items from the Impulsive Behavior Scale (IBS; Rosotto, Yager, & Rorty, 1998), the Risky Behavior Scale (RSS; Fischer & Smith, 2004), and the Depressive Interpersonal Relationships Inventory—Reassurance-Seeking subscale (DIRI-RS; Joiner, Alfano, & Metalsky, 1992) into a new 33-item scale. While many items were adapted from existing scales, the response scales were designed to reflect frequency of behaviors as opposed to assessing personality traits or urges.

The MBS explicitly measures the frequency of many maladaptive behaviors within the past month. Utilizing a scale for each behavior would take a significant amount of time and may impede the ability for a quick assessment if time limitations are present. Therefore, the MBS may be preferred in some settings (e.g., tracking progress in weekly therapy, primary care, research studies). The MBS assesses the frequency of the following behaviors within the last month: alcohol and drug use, risky sexual behavior, nonsuicidal self-injury, suicide attempts, maladaptive eating behaviors, theft, reckless driving, impulsive spending, gambling, verbal and physical aggression, and reassurance-seeking.

**Personality and Maladaptive Behaviors**

Maladaptive behaviors may be conceptualized as behavioral manifestations of psychological constructs, including personality traits. Engaging in behaviors due to impulsivity or affect may be described as behavioral dysregulation. For example, dysregulated behavior, such as binge drinking, may be associated with impulsivity, sensation seeking, or negative affect. This is evidenced by the literature examining the role of impulsivity in maladaptive behaviors (e.g., Anestis, Selby, & Joiner, 2007; Dir, Karyadi, & Cyders, 2013; Fischer, Smith, & Cyders, 2008). Maladaptive behaviors are often discussed as strategies for coping with symptoms of psychiatric disorders. For instance, personality pathology is associated with behaviors that may relieve negative affect (e.g., cutting).

The Emotional Cascade Model (Selby & Joiner, 2009) postulates that rumination (repeatedly thinking about and focusing on negative emotion-salient stimuli; Nolen-Hoeksema, 1991) about negative affect prompts the engagement of dysregulated behaviors to help the individual deal with the emotional intensity of the negative affect (that was increased as a result of the rumination) and may act as a distraction. This cycle is self-perpetuating (Selby & Joiner, 2009). Thus, engaging in these behaviors serves as a way to alter mood away from a negative state, which may produce short-term relief. However, the utilization of this cycle as a means of coping likely results in negative long-term outcomes associated with repeatedly engaging in maladaptive behaviors. For example, an individual may have a negative interaction with her partner, which then leads to negative cognitions and negative emotions (e.g., anger, shame). The person may then ruminate about this interaction, which increases negative affect. As the negative affect

increases, emotional stimuli becomes more salient and attracts more focused attention. This is a positive feedback loop, which increases the person's rumination on the negative emotions, ultimately keeping them around longer. In order to interrupt this intense emotion-fueled cycle, the individual may attempt to distract himself or herself with certain behaviors. Distraction can come in various forms, such as nonsuicidal self-injury, binging, or substance use. In this example, these behaviors may rapidly shift her attention towards another physical sensation (e.g., the sensation from cutting), rather than the heightened focus on the rumination and negative affect. The distraction then stops the cycle, and provides short-term relief (negative reinforcement), increasing the likelihood that she will engage in the behavior again. It is important to note that Selby and Joiner (2009) state that while there are healthy methods of distraction that are commonly used and effective (e.g., going for a walk, talking with a friend), these distraction techniques may not be strong enough to stop the "Cascade". Thus, more intense behaviors are utilized as a method of distraction. These behaviors may be more effective in fully removing the person from the cycle.

It is evident that maladaptive behaviors (i.e., behavioral dysregulation) are strongly tied to emotional/affective dysregulation (Anestis, Bagge, Tull, & Joiner, 2011; Klonsky, 2007; Selby & Joiner, 2009). Emotional dysregulation has been proposed as a mechanism of maladaptive behaviors, some of which are associated with psychopathology. For example, in a sample of patients with PTSD and substance abuse disorder diagnoses, emotional dysregulation mediated the relationship between PTSD and impulsive behaviors (Weiss, Tull, Viana, Anestis, & Gratz, 2012). Difficulties with regulating emotions have been associated with nonsuicidal self-injury, binge eating, risky

sexual behavior, and alcohol use (Cooper, Frone, Russell, & Mudar, 1995; Klonsky, 2007; Messman-Moore, Walsh, & LiLillo, 2010; Whiteside et al., 2007). The desire to commit suicide has been associated with emotion dysregulation (defined as high negative urgency and low distress tolerance; Anestis et al., 2011). Other research has examined one's personality trait predisposition to engage in risky behaviors. For instance, Cooper, Wood, Orcutt, and Albino (2003) examined determinants of risky behaviors in adolescents and young adults and concluded that poor impulse control (impulsivity) and avoidant coping styles (difficulties with regulating emotions) were significant predictors of certain risky behaviors (substance use, risky sexual behavior, truancy/school issues, running away, property crimes, violent crimes, educational underachievement). Further, trait impulsivity is a biological vulnerability of BPD, along with other biopsychosocial and environmental factors (Crowell, Beauchaine, & Linehan, 2009; Linehan, 1993). Impulsivity and emotion dysregulation in BPD are also associated with maladaptive coping behaviors (Carpenter & Trull, 2013; Crowell et al., 2009; Linehan, 1993). Thus, impulsivity appears to play an important role in the relationship between affective and behavioral dysregulation.

**Impulsivity**

There are many conceptualizations of impulsivity—the current study focuses on a multidimensional trait approach. From this perspective, the construct of impulsivity has been further specified into facets to help elucidate the aspects that may be differentially related to behaviors or outcomes. The UPPS model of impulsivity includes four facets of impulsivity including: urgency, sensation seeking, lack of premeditation, and lack of perseverance (Whiteside, Lynam, Miller, & Reynolds, 2005). Since the initial

development of the UPPS scale, urgency has been divided into positive and negative urgency; the UPPS-P (Lynam, Smith, Whiteside, & Cyders, 2006) assesses all five facets of impulsivity. The scale will be referenced as the 'UPPS' when discussed studies that utilized the original scale with four facets and 'UPPS-P' for those that used the revised scale with five facets. Whiteside and Lynam (2001) outline the components of: negative urgency (the tendency to act impulsively under conditions of negative affect); positive urgency (the tendency to act impulsively under conditions of negative affect), lack of premeditation (acting on the spur of the moment, failing to consider consequences before engaging in a behavior), lack of perseverance (difficulties sticking to task and doing what they want/need to do), sensation seeking (enjoying and pursuing exciting activities and being open to new experiences that might be dangerous/risky). The four original UPPS facets represent variants of Five Factor Model of personality (FFM; Costa & McCrae, 1992) facets. Specifically, negative urgency represents high FFM impulsiveness, lack of premeditation represents low FFM deliberation, lack of perseverance represents low FFM self-discipline, and sensation seeing represents high FFM excitement seeking.

Negative urgency is defined as the tendency to act quickly and without planning in the face of negative affect. Negative urgency is related to and precipitates some maladaptive behaviors. For example, this facet of impulsivity has been associated with drinking to cope, excessive reassurance seeking, nonsuicidal self-injury, and symptoms of bulimia (Anestis et al., 2007; Fischer et al., 2008; Glenn & Klonsky, 2010). Further, negative urgency assessed at one time point predicted drinking to cope, excessive reassurance seeking, and bulimia assessed at the same time point, and urgency also predicted reassurance seeking three to four weeks later (Anestis et al., 2007). Changes in

negative urgency over the three to four weeks predicted those maladaptive behaviors. In addition to these behaviors, negative urgency has also been associated with marijuana use (Kaiser, Milich, Lynam, & Charingo, 2012), aggression (Miller, Zeichner, & Wilson, 2012), and risky sexual behaviors (Deckman & DeWall, 2011). Anestis and colleagues (2007) suggest that urgency is a more precise component of impulsivity to consider when examining maladaptive behaviors. When examining problematic alcohol use, eating problems, and nonsuicidal self-injury, negative urgency was the only trait of UPPS-P impulsivity that was a risk factor for all of the maladaptive behaviors (Dir et al., 2013). Similarly, negative urgency and lack of deliberation were associated with disordered eating patterns and alcohol misuse symptoms in a sample of fifth grade girls and adult women (Fischer, Settles, Collins, Gunn, & Smith, 2012).

Taken together, the role of negative affect on maladaptive behaviors is significant when an individual cannot regulate that affect, leading to behavioral dysregulation (urgency). Glenn and Klonsky (2010) established that nonsuicidal self-injury was most strongly associated to the urgency facet of impulsivity. Within a group of individuals who self-harm, the lack of perseverance facet discriminated groups with more frequent self-harm behaviors (Glenn & Klonsky, 2010). Similarly, negative urgency has been associated with behavioral dysregulation (maladaptive facet variant of impulsiveness) on the Five Factor Borderline Inventory (FFBI; DeShong, Lengel, Sauer-Zavala, O'Meara, & Mullins-Sweatt, 2015). In fact, FFBI behavioral dysregulation was associated with all UPPS-P scales with the exception of sensation seeking and positive urgency in a sample of young adults that engaged in nonsuicidal self-injury (DeShong et al., 2015).

In addition to negative urgency, positive urgency, or the tendency to act impulsively in response to a positive mood, is associated with maladaptive behaviors, such as risky drinking and gambling (Cyders et al., 2007; Cyders & Smith, 2008) and risky sexual behavior (Deckman & DeWall, 2011). A meta-analysis of 115 papers that utilized the UPPS/UPPS-P measure indicated that negative and positive urgency had the strongest relationship across psychopathology (Berg et al., 2015). Positive urgency predicted unique variance among risky behaviors (Cyders et al., 2007). This suggests that positive urgency is an important component of impulsivity to consider when examining maladaptive behaviors such as those in the present study. Further, the classification of impulsivity into components can be useful as some types may predict certain pathology over others. For example, positive urgency is associated with alcohol use disorders, but not with eating disorders; whereas negative urgency is associated with both disorders (Cyders et al., 2007; Smith et al., in press). Within certain categories of related disorders, the UPPS model of impulsivity may help differentiate between disorders. For example, bulimia and binging-purging type anorexia are more similar, such that they are typically associated with higher levels of the UPPS impulsivity traits, whereas restrictive anorexia has less impulsivity (Claes, Vandereycken, & Vertommen, 2005).

Sensation seeking, another facet of the UPPS-P model, is associated with a variety of maladaptive behaviors, including risky sexual behavior (Deckman & DeWall, 2011) and alcohol use (Lejoyeux, Feuche, Loi, Solomon, & Ades, 1998). However, Whiteside and Lynam (2003) suggest that alcohol-related problems are primarily related to sensation seeking in adolescents, but the relationship does not typically replicate in adult samples. Sensation seeking is not related to all maladaptive behaviors, however. For

example, sensation seeking is not related to nonsuicidal self-injury and suicidal behaviors (Lynam, Miller, Miller, Bornovalova, & Lejuez, 2011).

Overall, the UPPS/UPPS-P Impulsive Behavior Scale and its subscales have been consistently related to various types of impulsive behaviors and the scale has good psychometric properties. A short version of the UPPS-P, the SUPPS-P (Lynam, 2013) was developed, and shows strong convergence with the UPPS-P (Cyders, Littlefield, Coffey, & Karyadi, 2014). The SUPPS-P subscales, which assess the same five components of impulsivity as the UPPS-P, all demonstrated good reliability, and fit the same factor structure as the longer version. Further, and important to the current study, the SUPPS-P was able to significantly shorten the length of administration time by 66% and had minimal variance lost (Cyders et al., 2014). The SUPPS-P will be the primary measure of impulsivity utilized for the validation of the MBS in the current study. The differentiation of facets, particularly urgency, is a benefit of the SUPPS-P that will likely result in greater specificity of impulsivity and maladaptive behavior relationships due to the associations between the construct of urgency and problematic behaviors.

**Five Factor Model and Maladaptive Behaviors**

As demonstrated with impulsivity, personality constructs are associated with maladaptive behaviors. Personality trait and related behavioral indicators are important to consider in the validation of the MBS. Specifically, there is evidence for links between traits and behaviors that can provide direction of expected convergence of the MBS with personality based measures. For example, many maladaptive behaviors relevant to the MBS are associated with neuroticism/negative affect. Thus, personality traits will be utilized as a measure of convergent validity.  A commonly used model of general

personality is the FFM (Costa & McCrae, 1992), which has five bipolar domains and six descriptive facets within each domain. The domains and facets include: neuroticism versus emotional stability (anxiousness, angry hostility, depressiveness, self-consciousness, impulsivity, vulnerability), extraversion versus introversion (warmth, gregariousness, assertiveness, excitement seeking, positive emotions), openness versus closedness to experience (fantasy, aesthetics, feelings, actions, ideas, values), agreeableness versus antagonism (trust, straightforwardness, altruism, compliance, modesty, tendermindedness), and conscientiousness versus disinhibition (competence, order, dutifulness, achievement striving, self-discipline, deliberation).

While the FFM is a model of general personality, a substantial amount of research has indicated the FFM applies to pathological personality, including DSM-5 personality disorders (Mullins-Sweatt & Widiger, 2006; Samuel & Widiger, 2008; Saulsman & Page, 2004). The FFM has been cited as a model of normal/general and abnormal personality traits (Clark, 2007) and the DSM-5 alternative model for personality disorders is considered to be an extension of the FFM (American Psychiatric Association, 2013). Taken together, research regarding the structure, application, and relevance of the FFM provides a strong argument for the utilization of the FFM in studies examining maladaptive behaviors associated with general and maladaptive personality traits. Further, existing literature regarding the FFM and many of these behaviors can inform expected relationships. Thus, the general relationship of FFM personality traits and maladaptive behaviors will be discussed in more detail below.

Across the FFM domains, there appears to be fairly consistent pattern of relationships with maladaptive behaviors. Specifically, high neuroticism, high

extraversion, low agreeableness, and low conscientiousness are associated with many maladaptive behaviors. Neuroticism is positively associated with alcohol and marijuana use, substance use more generally (in a clinical sample), nonsuicidal self-injury, emotional eating, anorexia, bulimia, impulsive driving, gambling, and delinquency behaviors (e.g., theft; Bagby et al., 2007; Cassin & von Ranson, 2005; Cellar, Nelson, & Yorke, 2000; Elfhag & Morey, 2008; Flory et al., 2002; Miller et al., 2012; Mullins-Sweatt, Lengel, & Grant, 2013; Ruiz, Pincus, & Schinka, 2008). Extraversion tends to be positively associated with alcohol use, risky sexual behavior, delinquency behaviors, gambling, and risky driving (Bagby et al., 2007; Dahlen & White, 2006; Flory et al., 2002; Miller et al., 2004; Miller et al., 2012). Most of these relationships are driven by the association with high sensation seeking, a facet of extraversion. However, introversion has also been associated with aggression (Jones, Miller, & Lynam, 2011) and emotional eating behaviors, including binge eating (Elfhag & Morey, 2008). Agreeableness and conscientiousness are negatively associated with alcohol and marijuana use, risky sexual behavior (e.g., not using protection), nonsuicidal self-injury, anorexia and bulimia, delinquency behaviors, risky driving, and aggressive behavior (Brown, 2009; Cassin & von Ranson, 2005; Flory et al., 2002; Jolliffee, 2013; Miller, Lynam, & Jones, 2008; Miller et al., 2004; Renner & Anderle, 2000). Conscientiousness is also negatively associated with gambling and emotional eating (Bagby et al., 2007; Elfhag & Morey, 2008).

The overarching domain associations between the FFM and maladaptive behaviors are fairly consistent. However, facet level relationships can provide more information and further differentiate behaviors. For example, sensation seeking (facet of

extraversion) seems to be the main trait that drives relationships with maladaptive behaviors. However, sensation seeking is a trait of pathological and non-pathological gamblers; therefore, while it provides useful information, additional facets may be helpful in differentiating aspects of the behaviors (such as maladaptivity or associated impairment). Pathological gamblers tend to have higher neuroticism (impulsiveness) and disinhibition (deliberation and self-discipline) compared to non-pathological gamblers with similar levels of sensation seeking (Bagby et al., 2007). Thus, having a profile of FFM traits may help to identify the certain propensity for maladaptive behaviors. For instance, high neuroticism and low conscientiousness, in tandem with excitement seeking may be associated with maladaptive, or pathological levels of gambling behaviors (Bagby et al., 2007).

Similar differentiations between traits can be seen with maladaptive eating behaviors. In general, maladaptive eating behaviors (binging and restricting type behaviors) have been associated with neuroticism, low agreeableness (compliance), and perfectionism. However, bulimia has been more strongly related to impulsivity traits (e.g., sensation seeking), and anorexia has been associated with lower impulsivity, higher constraint, higher self-discipline, and lower sensation seeking and desire for novel activities on various measures of personality including the NEO PI-R, MPQ, and MMPI-2 (Cassin & von Ranson, 2005). Overall, the research indicates a distinction within maladaptive eating patterns, such that restriction and binging behaviors have some personality traits in common (neuroticism, aspects of antagonism); however, many traits are differentiated (e.g., impulsivity) by type of eating behavior. This is likely the case for other groups of maladaptive behaviors as well.

Neuroticism is associated with many maladaptive behaviors; therefore, it warrants additional discussion. Neuroticism as a domain tends to be strongly associated with behaviors related to negative affect (e.g., nonsuicidal self-injury), and less frequently with other impulsive behaviors, such as risky sex. For instance, risky sexual behavior generally has a small relationship with neuroticism across studies. While impulsiveness is often associated with risky sexual behaviors, neuroticism does not likely exhibit a systematic relationship to sexual risk taking (Hoyle et al., 2000). Within community samples, the relationship between neuroticism and substance use tends to diminish after accounting for internalizing disorders; however, neuroticism remains a significant predictor of substance use in clinical samples (Flory et al., 2002; Ruiz et al., 2008). Neuroticism also was high in an adolescent offender sample. Based on the mixed literature and complexity of maladaptive behaviors, facet-level identification of neuroticism facets may provide incremental information regarding maladaptive behaviors depending on the behavior and the sample.

Finally, some maladaptive behaviors demonstrate mixed relationships with personality traits in the literature. For example, some research has suggested risky driving is primarily associated with neuroticism, agreeableness, and openness (e.g., Cellar et al., 2000; Dahlen & White, 2006), whereas other literature indicated low conscientiousness and high extraversion were most strongly associated with unsafe or risky driving behaviors (Arthur & Graziano, 1996; Renner & Anderle, 2000). Additional research is needed within some areas to further elucidate these relationships. The primary findings suggest that high neuroticism and extraversion (primarily sensation seeking) and low agreeableness and conscientiousness are associated with maladaptive behaviors.

Openness to experience has been linked with some behaviors (e.g., marijuana use, nonsuicidal self-injury), although this domain is not as prominent.

In conclusion, it is evident that neuroticism and extraversion are positively associated with maladaptive behaviors, whereas agreeableness and conscientiousness are primarily negatively related to these behaviors. Other research has indicated that extraversion and low conscientiousness (disinhibition) are some of the most robust personality predictors of risky health behaviors in college students (Raynor & Levine, 2009). Behavioral dysregulation, or acting on a behavior due to impulsivity and/or in a response to affect, appears to be a driving force of engaging in maladaptive and risky behaviors.

**Personality Disorders**

The maladaptive behaviors assessed on the MBS often co-occur with personality disorders. Some of the behaviors are symptoms or criteria of the disorder (e.g., antisocial personality disorder and aggression; BPD and self-injury); therefore it is not surprising that maladaptive behaviors co-occur with maladaptive personality traits. There are empirical data demonstrating the link between many of these behaviors and disorders. For example, substance misuse, often in the form of substance use disorders, are highly co-morbid with personality disorders, with 60% of persons with substance use disorder also having a PD diagnosis (Skodol et al., 1999). BPD is highly comorbid with substance use disorders, which has been attributed to similar mechanisms underlying both disorders, such as impulsivity and affective instability (Trull, Sher, Minks-Brown, Durbin, & Burr, 2000). Antisocial personality disorder is also highly comorbid with alcohol use, and some researchers have suggested this is due also to underlying

mechanisms and behavioral genetics that make a person susceptible to these two disorders (Waldman & Slutske, 2000).

Nonsuicidal self-injury and suicidality are also common for persons with personality disorders, particularly BPD (Oldham, 2006). Uncompleted suicide attempts are also very common in individuals with BPD; persons with BPD have a suicide rate at 8 to 10%, which is 50 times higher than to the general population (APA, 2001; Black, Blum, Pfohl, & Hale, 2004; Gunderson & Ridolfi, 2001). It may be that BPD is one of the PDs with the highest rate of self-injury and suicidality; however, it also may be an artifact of the disproportionate amount of research focused on BPD compared to other PDs. Further research examining maladaptive behaviors and all PDs, particularly PDs less-represented in the literature is warranted.

Binge eating and DSM eating disorders are also associated with PDs. The most common PDs associated with eating disorders (anorexia and bulimia) are borderline, dependent, and avoidant, and obsessive compulsive personality disorder is more commonly associated with anorexia than bulimia (Bornstein, 2001). Cassin and Ranson's (2005) meta-analysis suggested that BPD is the PD most strongly associated with binge eating, and mainly supports Bornstein's (2001) findings.

It is not uncommon for problematic gambling to be comorbid with BPD (Brown, Allen, & Dowling, 2014). There are similarities across these two constructs, such as emotion dysregulation and impulsive behaviors. Additionally, risk factors for BPD in the biosocial model (e.g., emotion regulation difficulties, high risk transactions between parent-child) also apply to pathological or problematic gambling (Brown et al., 2014). When examining personality disorders in relation to gambling more generally, research

has indicated that as the number of problematic gambling behaviors increases, the chance that the individual meets criteria for a personality disorder also increases (Desai & Potenza, 2008). Finally, persons with a gambling problem and personality disorder have higher levels of impulsivity compared to pathological gamblers without a personality disorder (Blaszczynki & Steel, 1998). These data suggest that problematic gambling, personality disorders, and impulsivity are related, which would likely suggest increased impairment and difficulties for persons with these comorbid conditions.

# APPENDIX C

# IRB APPROVAL

## Oklahoma State University Institutional Review Board

| | |
|---|---|
| Date: | Friday, November 06, 2015 |
| IRB Application No | AS1587 |
| Proposal Title: | A brief study of personality traits and behaviors |

Reviewed and Processed as: Exempt

**Status Recommended by Reviewer(s): Approved Protocol Expires: 11/5/2018**

Principal Investigator(s):


Ashley C. Helle
116 N Murray
Stillwater, OK 74078

Stephanie Mullins-Sweatt
116 North Murray
Stillwater, OK 74078


The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1.Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms
2.Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3.Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
4.Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Scott Hall (phone: 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,

Hugh Crethar, Chair
Institutional Review Board

## Oklahoma State University Institutional Review Board

| | |
|---|---|
| Date: | Monday, May 09, 2016 |
| IRB Application No | AS1649 |
| Proposal Title: | Assessment of your typical behaviors and personality traits |
| Reviewed and Processed as: | Exempt |

**Status Recommended by Reviewer(s): Approved  Protocol Expires: 5/8/2017**

Principal Investigator(s):


Ashley C. Helle
116 N Murray
Stillwater, OK 74078

Stephanie Mullins-Sweatt
116 North Murray
Stillwater, OK 74078


---

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1.Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms
2.Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3.Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
4.Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Scott Hall (phone: 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,

Hugh Crethar, Chair
Institutional Review Board

VITA

Ashley Colleen Helle

Candidate for the Degree of

Doctor of Philosophy

Dissertation: VALIDATION OF THE MALADAPTIVE BEHAVIOR SCALE IN THREE SAMPLES

Thesis: A MULTI-METHOD APPROACH FOR ASSESSING THE ALTERNATIVE DSM-5 MODEL FOR PERSONALITY DISORDERS

Major Field: Clinical Psychology

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy/Education in Clinical Psychology at Oklahoma State University, Stillwater, Oklahoma in July, 2018.

Master of Science in Psychology at Oklahoma State University, Stillwater, Oklahoma in December, 2014.

Master of Arts in Psychology at University of Northern Iowa, Cedar Falls, Iowa in May, 2012.

Bachelor of Arts in Psychology at Mount Mercy University, Cedar Rapids, Iowa in February, 2010.

Experience:
Graduate Research Assistant
2012-present: Dr. Stephanie Mullins-Sweatt, Oklahoma State University
2010-2012: Dr. John E. Williams, University of Northern Iowa

Professional Memberships:
Association for Behavioral and Cognitive Therapies
Society for a Science of a Clinical Psychology
North American Society for the Study of Personality Disorders