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# Relationships Between Psychopathology, Impulsivity, and Disordered Eating

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# RELATIONSHIPS BETWEEN PSYCHOPATHOLOGY, IMPULSIVITY AND DISORDERED EATING

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## Abstract

Impulsivity is defined by behaviors that are often performed without foresight or consideration for consequences. For some individuals, impulsive behaviors are excessive or dysfunctional, and can become extremely problematic, ultimately leading to impairments in quality of life and lowered psychological functioning. Impulsivity is a multifaceted factor, comprising several different domains that have been explored in past studies (e.g., trait impulsivity, decision making, response inhibition). However, previous research shows that trait impulsivity in adults is consistently associated with several psychiatric problems including substance abuse, eating disorders, and compulsive sexual behaviors. To date, few studies have investigated impulsivity, compulsive sexual behavior. disordered eating, and overall psychopathology within non-clinical samples. Considering the debilitating effects of eating disorders, compulsive sexual behaviors, and chronic impulsive behavior, more research is necessary to determine the relationships of these factors with overall psychopathology.

My dissertation explores the interrelationships among impulsivity, compulsive sexual behavior, psychopathology, and disordered eating in two different non-clinical adult samples. The aims of this study were to 1) examine relationships amongst psychopathology, impulsivity, and disordered eating 2) conduct an exploratory aim to investigate relationships amongst disordered eating, impulsivity, and compulsive sexual behavior, and 3) compare sociodemographics, impulsivity, and disordered eating behaviors across samples.

This study included two different US samples: a college sample ($n$=2,161), and a general community sample ($n$=1,898). I used an identical analytic plan for both samples, in which I first calculated descriptive statistics and correlations between sample variables. Next, to determine potential sociodemographic covariates, I used MANOVA analyses to determine any associations

between sociodemographic variables and impulsivity. I then created mediation models to test for the influence of impulsivity and disordered eating on psychopathology, while adjusting for relevant sociodemographic variables. Within these models, impulsivity was the mediator, disordered eating was the independent variable, and a psychopathology composite was the dependent variable. In addition, I created an exploratory mediation model that tested the influence of impulsivity and disordered eating on compulsive sexual behaviors. The exploratory model used impulsivity as a mediator, disordered eating as the independent variable and compulsive sexual behaviors as the dependent variable.

Results indicated that for both samples impulsivity mediated the relationship between disordered eating and psychopathology (or compulsive sexual behavior). Results from the mediation analyses were consistent across the two different samples and indicate trait impulsivity as a major influence in the relationship between disordered eating and psychopathology (or compulsive sexual behaviors). In addition, there were sample differences in sociodemographics, disordered eating, and impulsivity. Future research should consider the development of impulsivity-focused treatments as either an adjunct or primary intervention for psychiatric disorders where impulsivity has been shown to be impactful (e.g., substance use disorders, eating disorders, gambling disorder). Additional research is also needed to determine how impulsivity may present in certain eating disorders where impulsive behaviors often present, such as in binge eating disorder or bulimia nervosa.

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# Chapter 1 - Introduction

## Background on Impulsivity

Impulsivity is a broad, multidimensional construct, encompassing a wide range of behaviors or responses often carried out on a whim, without prior forethought or consideration of future consequences (Patton, Stanford, & Barratt, 1995). All individuals engage in impulsive actions occasionally; however, when these behaviors become excessive or dysfunctional, they can become extremely problematic and lead to impairments in quality of life and psychological functioning (Dickman, 1990). Impulsivity often exacerbates psychiatric disorders, and disorders strongly characterized by impulsivity are typically grouped in the "Diagnostic and Statistical Manual of Mental Disorders, Fifth edition Text-Revision" (DSM-5-TR) under Disruptive, Impulse Control and Conduct Disorders (American Psychiatric Association [APA], 2022). Within this class of disorders, psychiatric conditions such as kleptomania, conduct disorder, intermittent explosive disorder, and several others have diagnostic criteria involving problems with impulsivity, primarily of which are symptoms encompassing a lack of control over urges and impulses (APA, 2022).

Within the DSM-5-TR, impulsivity is often a transdiagnostic symptom that is not confined to Disruptive, Impulse Control and Conduct Disorders, but can also be found in the hyperactive-impulsive diagnostic criteria for attention deficit hyperactivity disorder, which are comprised of numerous impulsivity-related diagnostic symptoms (e.g., "Interrupts or intrudes into conversations and activities of others") (APA, 2022). Other examples of transdiagnostic symptoms (sometimes referred to as processes) include intrusive memories found in a variety of psychiatric conditions, including anxiety, PTSD, and eating disorders (Brewin, Gregory, Lipton, & Burgess, 2010); or 'repetitive negative thinking' which is a feature of worry in generalized

anxiety disorder and appears in the form of ruminative thinking in depressive disorders (APA, 2022)

Impulsivity is also relevant in symptoms of gambling disorder, which was previously categorized as an impulse control disorder within the DSM-IV (where it was labeled as pathological gambling before reclassification in the DSM-5 as an addictive disorder) (APA, 2000). Finally, substance use disorders and behavioral addictions often include aspects of impulsivity, such as preference for immediate over delayed reward (Amlung et al., 2017; Robbins & Clark, 2015). Prior studies have found a strong relationship between addictive and impulse-control related disorders, with previous research indicating overlap in comorbidities, neurocircuitry, and neurochemistry (Fontenelle et al., 2011).

Men, relative to women, typically present more frequently with impulse-related disorders and behaviors; however, these differences might be attributed to women being more sensitive to punishment, while men show higher levels of trait sensation seeking (i.e., tendency to seek out new experiences and sensations) and present with higher risk-taking behaviors overall (Cross, Copping, & Campbell, 2011). Moreover, these sex differences in impulsivity tend to be more prominent in childhood, with girls regularly displaying superior abilities in delaying gratification, in addition to placing less value on immediate rewards compared to boys (Weinstein & Dannon, 2015). Sex differences in impulsivity during childhood may eventually lessen due to factors such as maturation, hormonal changes, and brain development (Weinstein & Dannon, 2015). Indeed, this finding has been supported by previous research indicating that trait aspects of impulsivity increase during young adolescence, but as children mature their trait impulsivity typically levels off or decreases (Littlefield et al., 2016). Further maturation and decrease in impulsive traits may also continue within adulthood (Littlefield, Sher, & Wood,

2009). Nevertheless, for a subset of people, impulsive behaviors and their related psychiatric disorders become long-lasting and problematic, and persistent impulsive behaviors might be related to the transition of recreational habits into disordered habits (Raybould, Larkin, & Tunney, 2022).

To date, there has been a lack of agreement on the mechanisms and causes of impulsivity. While several theories have explored potential mechanisms of impulsivity, these are often vague, overlapping, and lacking in specific explanations regarding the mechanisms of impulsivity (Enticott & Ogloff, 2006). This has led to confusion regarding the nature of impulsivity and debates about whether impulsivity should even be conceptualized as a construct. Nonetheless, it should be highlighted that previous research broadly examining the mechanisms underlying impulsivity have postulated multiple causal pathways, including but not limited to; acting without foresight, heightened autonomic arousal, emphasis on the present moment, inability to delay gratification, making up one's mind too quickly, and inhibitory dyscontrol (see Enticott & Ogloff, 2006 for a summary of these mechanisms).

When specifically considering personality (trait) impulsivity, the Urgency, (lack of) Premeditation, (lack of) Perseverance, Sensation Seeking (UPPS) model has gained prominence as a validated, reliable, and popular self-report method used to examine the multifactorial nature of trait impulsivity (Cyders et al., 2007; Whiteside & Lynam, 2001). The UPPS model can be used to describe mechanisms of impulsivity in a detailed and integrative approach. Previous research suggests that urgency relates to the inhibition of prepotent responses within general or emotional environments and in risky or ambiguous contexts; (lack of) premeditation is associated with inhibition of prepotent responses, decision making, and risk taking; (lack of) perseverance is associated with resistance to proactive interference in working memory, maintaining attention

and set shifting; and sensation seeking is characterized by an overactive approach system and diminished avoidance system (Rochat, Billieux, Gagnon, & Van der Linden, 2018). Using the UPPS model to examine impulsivity enables researchers to explore mechanisms of trait impulsivity more definitively in both healthy and clinical populations.

For my dissertation project, I focused on personality impulsivity assessed through the short Urgency, Premeditation (lack of), Perseverance (lack of), Sensation Seeking, Positive Urgency, Impulsive Behavior Scale (SUPPS-P), and examined how it related to disordered eating behaviors, compulsive sexual behavior, and aspects of psychopathology (i.e., depression , anxiety, and suicidal ideation related symptoms) in two distinct United States (US) samples (i.e., a college sample and a community-based sample). Mediation models explored the relationships between psychopathology, compulsive sexual behaviors, disordered eating, and impulsivity across both samples. The inclusion of two samples allowed for more in-depth analysis and comparisons across two unique populations.

## Chapter 2 - Literature Review

### Similar but Distinct: Differences Between Impulsivity and Compulsivity

Although similar aspects of impulsivity and compulsivity (e.g., a lack of self-control) are reflected in specific psychiatric disorders, impulsivity and compulsivity are classified as related, but distinct areas (Berlin & Hollander, 2014). While impulsivity is defined by risky, not well thought out actions, compulsivity is seen as the tendency to repeat non-goal related actions that are inappropriate to a situation, and often result in undesirable consequences (Dalley, Everitt, & Robbins, 2011). One way to differentiate impulsivity and compulsivity is that impulsivity relates to an inability to stop initiating actions, while compulsivity relates to an inability to terminate ongoing actions (Robbins et al., 2012). The relationship between impulsivity and compulsivity is complex, and thus far has not been fully teased apart in prior research with clinical samples (Carr et al., 2021). Yet, recent research has suggested that impulsivity and compulsivity uniquely contribute and interact to impact certain disorders (e.g., substance use disorders) (Brooks et al., 2017). It is posited that this process may occur through trait impulsivity acting as a vulnerability factor for substance abuse, which may precede the development of compulsive substance seeking behaviors (Brooks et al., 2017; Robbins et al., 2012).

### Domains of Impulsivity

Given that impulsivity is a multifaceted factor, several different domains of impulsivity have been explored by previous research. Impulsivity is difficult to isolate into one specific domain or definition, and as such, researchers have explored impulsivity in different areas, while also examining the state and trait aspects of impulsivity. Broadly, impulsivity has been measured by evaluating decision making, motor impulsivity processes (behaviors and behavioral inhibition), and trait impulsivity (typically personality impulsivity) (Evenden, 1999). Below, I

provide a brief review of the pertinent literature on decision making, motor impulsivity, and trait impulsivity.

### *Decision Making*

Decision making (otherwise known as reflection) is the process in which individuals make choices, including how people gather information and assess possible alternatives. Individuals make decisions every day of their lives, but impulsive decisions determined by momentary feelings or situational factors may lead to future problems and poor overall results. Past research supports that most people tend to rely more heavily on impulsive decision making when they are fatigued or overloaded (Vohs, Baumeister, & Schmeichel, 2012); however, there are a subset of individuals that seem to naturally gravitate toward risky and impulsive decisions (e.g., preference for immediate rewards, less consideration for punishments) (Franken et al., 2008).

Decision making can be a part of impulsivity and is often measured through intertemporal choice (deferment of reward) tasks in which individuals select between outcomes available at different times in the future. A popular measure of decision making, and intertemporal choice is the Iowa Gambling Task (IGT), wherein individuals are given four sets of cards that give either rewards or occasionally a loss (Bechara, et al., 1994). Individuals are told to choose cards that maximize their profits and long-term outcomes, and individuals who do well on this task typically learn to avoid high risk/reward options and instead choose cards from sets with safer but smaller rewards (Bechara, et al., 1994). A review of the IGT has found that pathological gamblers consistently show a preference for risky, more immediate rewards even if this comes at the cost of having larger net losses on the IGT (Brevers et al., 2013). Similar findings have been found on the IGT with general addictive behaviors, although deficits in

decision making may be more strongly expressed in gambling disorder as compared to alcohol dependence (Kovacs et al., 2017). This prior research has supplied convincing evidence of a significant crossover between impulsivity, substance use, and gambling disorder through comparable deficits in decision making,

Resembling the decision making evaluated by the IGT, delay discounting occurs when someone prefers small immediate rewards relative to larger, delayed rewards (Odum et al., 2020). Strong levels of delay discounting have been associated with many maladaptive behaviors such as gambling disorder severity (Alessi, & Petry, 2003), risky sexual behaviors (Johnson et al., 2015), drug abuse (MacKillop et al., 2011), and a host of other variables. Rewards may differ in importance, and previous research supports that delay discounting has both state-like and trait qualities (Odum et al., 2020).

***Motor Impulsivity (Behaviors and Behavioral Inhibition)***

Another facet of impulsivity is motor impulsivity, which entails controlling one's urges and motor movements. The stop-signal task and go/no go paradigms are measures that researchers have used to assess motor impulsivity. These measures evaluate a person's ability to respond and to not respond to stimuli, by using different trials where individuals must follow a set of instructions indicating when to press and when to not press a button. Making fewer errors on the go/no go and stop-signal task indicates a greater ability to inhibit responses. Inhibitory control is distinctly related to motor impulsivity, as indicated by worsened motor impulsivity when inhibitory control is taxed, which contrasts decision making processes, wherein inhibitory control challenges do not affect decision making (Caswell, Morgan, & Duka, 2013). In general, response inhibition deficits have been shown in diagnoses that contain symptoms of impulsivity,

including substance abuse disorders, attention deficit hyperactivity disorder, obsessive–compulsive disorder, and trichotillomania (Chamberlain & Sahakian, 2007).

### *Personality Impulsivity*

Personality impulsivity considers the trait-like characteristics of impulsivity and conceptualizes impulsivity as a fairly stable personality trait. Although there are other personality measures of impulsivity, one frequently used measure is the Urgency, Premeditation (lack of), Perseverance (lack of), Sensation Seeking, Positive Urgency, Impulsive Behavior Scale (UPPS-P), developed by Lynam and colleagues (2007). The impulsive personality traits in the UPPS-P model are (1) Negative and positive urgency, which is the tendency to experience strong reactions, frequently under the condition of negative or positive affect (such as problematic alcohol use when experiencing negative or positive emotions); (2) (Lack of) premeditation, defined as the tendency to consider the consequences of an behavior before engaging in that behavior; (3) (Lack of) perseverance, defined being able to remain focused on a task that might be boring and/or difficult; and (4) Sensation seeking, a tendency to enjoy and pursue exciting activities and an openness to trying new experiences (Lynam et al., 2007).

Negative and positive urgency as measured by the UPPS-P typically show the strongest relationships with overall psychopathology (Berg et al., 2015). Specifically, a review of the UPPS-P and substance use psychotherapy outcomes found that high pre-treatment levels of lack of premeditation and negative urgency related to poor treatment outcomes (Hershberger, Um, & Cyders, 2017). Regarding other subscales, sensation seeking is also commonly linked as a risk factor for substance use (e.g., alcohol, cannabis, and cigarette use), and in general, a positive association has been found between sensation seeking and substance use (Evans-Polce et al., 2018). This relationship between sensation seeking and substance use may be especially strong

during late adolescence as compared to other periods of the lifespan (Evans-Polce et al., 2018). Moreover, negative urgency may link substance use and internalizing disorders, with negative urgency indicated as a partial mediator of the relationship between major depressive disorder and substance use (cannabis) problems (Gunn et al., 2018).

Impulsivity has broadly been linked to other psychiatric diagnoses such as hypersexuality (also known as compulsive sexual behavior disorder) (Bőthe et al., 2019), wherein individuals often fail to resist impulses to engage in sexual behaviors despite negative long-term consequences (Kaplan & Kreuger, 2010). Akin to what has been suggested by substance use research, negative urgency plays a key role in compulsive sexual behavior, in that negative urgency may moderate the relationship between broad compulsive sexual behavior and specific compulsive sexual behaviors (i.e., unsolicited sexting) (Garner et al., 2022). Unfortunately, urgency (particularly negative urgency) has been linked to a host of other dangerous behaviors as well, with risky sexual behaviors found to be highest in people with higher sensation seeking behaviors or higher urgency in both non-clinical (Deckman & DeWall, 2011) and clinical samples (Curry et al., 2018). Suicide and its relationship with negative urgency is important to consider as well because research suggests that elevated levels of negative urgency, perceived burdensomeness, thwarted belongingness, and the acquired capability for suicide predict suicide attempts (Anestis & Joiner, 2011).

Other, non-addictive disorders, show strong relationships with impulsive personality traits as well. For example, eating disorders (i.e., binge eating disorder and bulimia nervosa), binge eating symptoms, and diagnoses are consistently associated with higher scores on both positive and negative urgency UPPS-P subscales (Anestis et al., 2009; Kenny, Singleton, & Carter, 2019; Stojek et al., 2014). Binge eating includes elements of both impulsivity and

compulsivity (Hutson, Balodis, & Potenza, 2018), and has been hypothesized to share similarities with substance use disorders, due to impulsive reward seeking behaviors eventual progressing into compulsive, habitual actions (Berridge, 2009). Strengthening this theory is recent research which presented evidence that US college students classified as having binge eating disorder showed numerous positive associations (small effect sized) with different psychiatric factors but had medium to large effect sizes for relationships between binge eating disorder and impulsive or compulsive traits (Solly, Chamberlain, Lust, & Grant, 2023). Exploring similarities between eating disorders and addictive or impulse control disorders may help to better conceptualize and understand the role of impulsivity and compulsivity in both eating and addictive disorders.

A greater examination of the relationships between impulsivity and compulsivity and their impact on disordered eating habits and addictive behaviors could provide a better clinical profile of the co-occurrence of such behaviors and inform the development of new treatments aimed at addressing underlying symptom profiles of distressed individuals reporting issues with disordered eating (see Figure 9 for a summary of relationships between psychiatric concerns and trait impulsivity).

**Eating Disorders: Etiology and Subtypes**

Eating disorders are serious psychiatric conditions that include persistent irregularities in eating habits, and distressful thoughts and emotions regarding eating behaviors. The DSM-5-TR recognizes anorexia nervosa (AN), binge eating disorder (BED), and bulimia nervosa (BN) as the principal eating disorders impacting adolescents and adults (APA, 2022). AN normally involves extreme restriction of food intake leading to a markedly low body weight, in addition to extreme fears of gaining weight and/or preoccupation with body shape (APA, 2022). Binge

eating symptoms may occur in the binge-purge subtype of AN, but these symptoms are not required criteria for a diagnosis of the more commonly seen restrictive AN. In contrast, binge eating is a primary symptom of both BED and BN. BED was first classified as an eating disorder in the DSM-5 and is characterized by regular occurring episodes in which objectively large amounts of food are consumed, with an accompanying feeling of a loss of control, and without engagement in recurrent compensatory behaviors (APA, 2022). Likewise in BN, binge eating episodes also occur, but individuals use unhealthy compensatory strategies (e.g., laxative use, excessive exercise, intentional vomiting) in attempts to offset binge eating behaviors (APA, 2022). Eating disorders can be extremely dangerous to both mental and physical health, and individuals with eating disorders present with high mortality rates (Smink, Van Hoeken, & Hoek, 2012). Recovery from an eating disorder is an arduous process for people, given that they may be in recovery for many years or go through cycles of relapse and recovery (McFarlane, Olmsted, & Trottier, 2008). For my dissertation project, I focused on binge eating behaviors typically found within BN or BED and overall disordered eating symptomatology.

Disordered eating symptoms (e.g., binge eating, overeating, weight and shape concerns) may not develop into or meet the full diagnostic requirements for an eating disorder but can still be extremely debilitating. Research on disordered eating symptoms is crucial as prior research has shown that disordered eating symptoms are associated with negative health outcomes. In adolescent and adult women, binge-eaters and overeaters are more likely to develop depressive symptoms as compared to their peers (Skinner et al., 2012). However, anxiety and stress also show unique associations with binge eating, independent of depression (Rosenbaum & White, 2015). Other researchers examining disordered eating symptoms found that over-evaluation of weight and shape is associated with higher eating pathology and psychosocial impairment

(Linardon, 2015). Further emphasizing the need to consider disordered eating symptoms is evidence suggesting that full syndromal BED appears to be quite similar in presentation to partial (or subthreshold) levels of BED (Crow et al., 2002). Focused and appropriate treatments are needed to help prevent transition of subthreshold eating disorder symptoms into eating disorders, (Stice et al., 2010).

### *Prevalence, Pathways, and Comorbidities of Eating Disorders*

Prevalence rates estimate that BED is the most common eating disorder diagnosis in US adults, with lifetime prevalence estimates ranging between 0.85% and 2.8% (Hudson et al., 2007; Udo & Grilo, 2018). The US adult lifetime prevalence rates were lower at 0.6% and 1% for AN, and BN, respectively. Generally, eating disorders are more commonly diagnosed in young, White, women; however, eating disorders are also harmful in ethnic minority populations (Perez et al., 2021) and males (Gorrell & Murray, 2019). College students are a vulnerable population to develop eating disorders, and prior research estimates eating disorders to be prevalent in ~8% to 17% of college aged women (Reinking & Alexander, 2005). This is concerning, as college students present with high overall rates of psychiatric disorders (Blanco et al., 2008), which increases the possibility that a student suffering from an eating disorder during college, may simultaneously experience another mental disorder. Eating disorders have been frequently examined in US college samples, however these disorders are repeatedly underrecognized community samples (Hart et al., 2011).

Eating disorders are multifaceted, and occur through genetic, biological, environmental, sociocultural, and psychological pathways. Family and twin studies indicate that all eating disorders are heritable, but heritable estimates have varied (Thornton, Mazzeo, & Bulik, 2010). The sociocultural context is important to consider in eating disorders, as sociocultural messages

(from family, peers, or media) encouraging a "thin ideal" are harmful (Culbert, Racine, & Klump, 2015). Sociocultural messages are often focused on the thin ideal are disproportionally aimed at women, who in turn may feel pressure or an expectation to conform to real or perceived media and cultural expectations, potentially leading to exacerbated eating disorder pathology or development of eating disorders (Culbert, et al., 2015). These messages may be especially hard to avoid when online since they may be delivered through social media networks or advertisements. Body image concerns are a cross-cutting symptom across all eating disorders, with research showing that problematic social media usage relates to disordered eating symptoms, body image concerns and lowered self-esteem (Santarossa & Woodruff, 2017). Moreover, eating disorders strongly impact psychological functioning with accompanying feelings of shame, isolation, and a preoccupation with shape/weight (Fairburn, 2008; Keith, Gillanders, & Simpson, 2009).

Unfortunately, BN is associated with other medical comorbidities, and because of repeated vomiting (one of the most common compensatory behaviors in BN), dental erosion, acid reflux, gastrointestinal issues, pulmonary and heart complications can occur (Mehler & Rylander, 2015). When considering laxative usage in BN, gastrointestinal issues once again can occur, in addition to severe colon problems with extreme constipation, or concerns regarding chronic diarrhea. The high mortality rate in eating disorders can be partly explained by medical factors and the increased suicide risk that is associated with eating disorders (Udo, Bitley, & Grilo, 2019). In this study's data from a representative US sample of adults, prevalence rates of suicide attempts for individuals with a history of eating disorders was as follows: BN (31.4%), AN (24.9%) and BED (22.9%) (Udo et al., 2019).

Individuals with eating disorders are at risk of suffering various comorbid psychiatric disorders as well. Common psychiatric comorbidities among individuals with eating disorders are obsessive–compulsive disorder, substance use disorders, anxiety and depressive disorders (Hudson et al., 2007). Although not an extensive area of research, the current literature on disordered eating and sexual behaviors suggests that binge eating habits are associated with compulsive sexual behaviors (Etuk et al., 2022), and that eating pathology in general may be related to sexual behaviors (Castellini et al., 2019). Sexual dysfunction has been found to be associated with disordered eating symptom severity (e.g., body image concerns), and risky sexual behaviors have been noted in BN, and are hypothesized to occur due to underlying impulsivity underlying purging and binge eating habits (Castellini et al., 2019). Further research has supported a relationship between impulsivity, sexual behaviors, and BN symptoms, as for women the relationship between compensatory behaviors (e.g., purging) and sexual experiences was partially mediated by impulsivity (Culbert & Klump, 2005). Additionally, trait impulsivity has predicted the presence and/or increased severity of symptoms of substance use, gambling, binge eating, and hypersexuality, providing more support for the transdiagnostic and co-occurring nature of impulsivity (Carr et al., 2021). It is also important to consider that eating disorders in women can result in the disturbance of both menstrual and hormonal functioning, both of which are involved in crucial processes of sexual functioning. Overall, eating disorder diagnoses frequently present with high co-morbidity with a variety of psychiatric factors, and the following section more closely examines the relationship between trait impulsivity and eating disorders.

**Personality Impulsivity and Eating Disorders: Research Gaps Remain**

Previous research supports the belief that binge eating related diagnoses, rather than restrictive eating disorders, are more frequently associated with impulsivity (Dawe & Loxton, 2004). UPPS-P impulsive personality traits differ among eating disorders as bingeing and purging eating disorders tend to present with elevated sensation seeking behaviors compared to restrictive eating disorders, although there have been mixed results for lack of planning and lack of premeditation (Lavender & Mitchell, 2015). Urgency (specifically negative urgency) has by far the strongest relationship to eating disorders, as several studies have shown elevated levels of negative urgency in eating disorder samples (Kenny et al., 2019; Manwaring et al., 2011). Research in this area also indicates that negative urgency is associated with disordered eating symptoms (Anestis et al., 2009).

A dual diagnosis population of individuals with high impulsivity and an eating disorder may be at higher risk for developing other psychiatric comorbidities such as substance use disorders (Lilenfeld et al., 1997; Wonderlich et al., 2005). This may be particularly relevant in BN, as past research has hypothesized BN to contain two unique subgroups: (1) a multi-impulsive group with disordered personality traits and patterns of impulsivity, and (2) a traditional neurotic group that presents with lower impulsivity (Lacey & Evans, 1986). Importantly, a multi-impulsive eating disorder group may not gain as much benefit from psychological treatment compared to a non-multi-impulsive eating disorder group. This was evident in a comorbid multi-impulsive eating disorder group who were given guided self-help treatment, but still presented with high depressive levels and subthreshold BN symptoms at the end of treatment (Bell & Newns, 2002).

Currently, the theory of a multi-impulsive subgroup in BED has rarely been examined by past research, but could potentially be relevant as BED shares similarities in presentation to BN.

The limited research available on this topic supports subtyping of BED, as patients with BED and general impulsivity in at least two domains report greater depressive symptoms, greater severity of eating disorder psychopathology, and higher rates of comorbidity than BED patients without general impulsivity (Boswell & Grilo, 2021). Furthermore, higher negative urgency has been a predictor of slower and less beneficial treatment outcomes for BED patients, in addition to food-specific response inhibition predicting higher eating disorder pathology at baseline, post-treatment and follow-up for BED patients (Manasse et al., 2016). Impulsivity and potential subtyping with disordered eating behaviors needs further examination in a more general population, since previous research in this area has focused on medical or treatment seeking populations diagnosed with eating disorders.

**Current Study**

As previously mentioned, one avenue in which prior literature has explored impulsivity's relationship with eating disorders is through examining a "multi-impulsive" subset of individuals who present with eating disorders, in addition to impulsive behaviors. However, this research has focused primarily on individuals diagnosed with BN, and there is scant research investigating whether a similar "multi-impulsive" group may exist for populations with broader disordered eating symptoms. More research is needed to investigate the influence of impulsivity on the relationship between disordered eating and overall psychopathology in general, non-clinical samples. In addition, assessing for the impact of impulsivity on binge eating symptoms and psychopathology for general samples will add to the limited literature in this area, and could provide support for the conceptualization of a "multi-impulsive" group with BED or binge eating symptoms. Furthermore, as disordered eating symptoms have been indicated to be deleterious

and more frequent than diagnoses of eating disorders, more generalizable research is needed with non-clinical samples.

Considering the current research gaps, I investigated disordered eating symptoms, psychopathology, and trait impulsivity in two distinct US samples, which allowed for more in-depth comparisons of my results across a college and community sample. In highlighting the unique role of impulsivity, I sought to better tease apart the relationships between impulsivity disordered eating behavior, and psychopathology across two culturally diverse non-clinical US samples. Below, I have described my study aims and hypotheses.

**Overarching Aims**

**Aim 1**: Examined relationships amongst psychopathology, impulsivity, and disordered eating by using mediation models.

**Aim 1, H1:** I predicted that impulsivity would mediate the relationship between disordered eating and psychopathology.

**Aim 2:** As an exploratory aim, I examined relationships amongst disordered eating, impulsivity, and compulsive sexual behavior within mediation models.

**Aim 1, H2:** I predicted that impulsivity would mediate the relationship between disordered eating and compulsive sexual behavior in these models.

**Aim 3:** Compared sociodemographics, impulsivity, and disordered eating behaviors in two different US samples; a sample of college students and a community-based sample.

**Aim 3, H3**: In line with previous research, I predicted that for both samples women would present with higher disordered eating symptomology compared to men. No specific hypotheses were put forth for impulsivity or sociodemographic differences.

# Chapter 3 - Method

## US College Participants (Sample 1)

Students within introductory psychology courses were recruited from online SONA systems subject pools within two public universities in the Southeast and Southwest regions of the US. Students signed up to participate on SONA and were then provided a link to an online Qualtrics survey which took approximately 45 minutes to complete. This study was approved by both college's Institutional Review Boards and students provided consent prior to beginning the survey. This study contained a total of 2,175 participants. This current project was part of a larger data collection effort examining mental and sexual health among college students which completed data collection in May 2021, and has been used in a publication (see Habashy, et al., 2023 for details).

## Measures for College Sample

### *Demographics*

A sociodemographic questionnaire was used to obtain information on biological sex (male or female), age, body mass index (BMI), race/ethnicity (white or non-white), and sexual orientation (heterosexual or sexual minority) (see Appendix A).

### *The Eating Disorder Examination Questionnaire 6.0 (EDE-Q)*

The Eating Disorder Examination Questionnaire 6.0 (hereafter referred to as the EDE-Q) assessed disordered eating cognitions and behaviors (Fairburn & Beglin, 2008) (see Appendix B). The EDE-Q was created as a self-report alternative to the eating disorder examination interview, which is a structured interview evaluating eating disorder pathology, and widely considered to be a gold standard for assessing eating disorders (Fairburn, Cooper, & O'Connor, 1993). Research has supported that the EDE-Q has good concurrent validity with the eating

disorder examination interview, and acceptable criterion validity (Mond et al., 2004). In addition, the EDE-Q has demonstrated acceptable to high internal consistency and test-retest reliability (Berg, Peterson, Frazier, & Crow, 2011). There are 22 items in the EDE-Q that assess symptoms from the past 28 days, with these items rated on a seven-point rating scale (0=characteristic was not present to 6=characteristic was present every day or in extreme form). Scores are averaged for each subscale, and four subscales include dietary restraint, body shape concerns, body weight concerns, and eating concerns. The total score on the EDE-Q is the average of the four subscales, and higher scores represent increased levels of overall eating pathology (scores range from 0 to 132). For the global total score on the EDE-Q suggested clinical cut-off scores are 4.0 or higher for women (Luce, Crowther, & Pole, 2008; Mond et al., 2006) and 1.68 or higher for men (Schaefer et al., 2018).

The remaining six EDE-Q are behavioral frequency indicators of eating habits (e.g., laxative use). However, these behavioral indicators were not used in any analyses for my dissertation. In this study, the EDE-Q demonstrated excellent internal consistency (Cronbach's alpha=.95).

***DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure - Adult***

The DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure assessed for psychiatric functioning during the past two weeks at the time of the assessment (DSM-5 Level 2; American Psychiatric Association, 2013a). This measure contains 23 items that evaluate 13 psychiatric domains of anger, anxiety, depression, dissociation, mania, memory, personality functioning, psychosis, repetitive thoughts and behaviors, sleep problems, somatic symptoms, substance use, and suicidal ideation. These items are rated on a five-point scale (0=none or not at all to 4=severe or nearly every day) and examine the past two weeks (See Appendix C for specific

items). For the current study, I used only the anxiety, depression, and suicidal ideation subscales. These three subscales were examined separately and combined into a psychopathology composite. The DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure has demonstrated acceptable internal validity and strong convergent and criterion-related validity (Bravo, Villarosa-Hurlocker, & Pearson, 2018), in addition to good to excellent test-retest reliability across most domains (Narrow & Kuhl, 2011). In this study, the DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure demonstrated acceptable internal consistency for the depression, and anxiety subscales, and for the psychopathology composite (Cronbach's alpha of .81, .83, .86, respectively).

***DSM-5 Level 2-Substance Use-Adult***

The DSM-5 Level 2-Substance Use-Adult (DSM-5 Level 2; American Psychiatric Association, 2013b) is an adapted version of the National Institute on Drug Abuse—Modified Alcohol, Smoking, and Substance Involvement Screening Test. This 15-item measure assesses the use of illicit substances and prescription medications in adults who are 18 years of age and older. The DSM-5 Level 2 measures the frequency of drug use over the past year and asks participants about medicine use from 0=none at all to 4=nearly every day. Data on the following substances are collected by the DSM-5 Level 2 measure: painkillers (e.g., Vicodin), stimulants (e.g., Adderall), sedatives or tranquilizers (e.g., valium), marijuana, cocaine or crack, club drugs (e.g., ecstasy), hallucinogens (e.g., LSD), heroin, inhalants, or solvents (e.g., glue), and methamphetamine. In addition to the previous items, I adapted the DSM-5 Level 2 measure to include three other substances use response options: smoking or chewing tobacco (e.g., cigarettes, cigar, pipe, snuff), vapes or e-cigarettes, and an option for participants to report

"other" substances (see Appendix C for specific items). In this study, the DSM-5 Level 2 measure demonstrated acceptable internal consistency (Cronbach's alpha=.64).

***Short form Urgency, Premeditation (lack of), Perseverance (lack of), Sensation Seeking, Positive Urgency, Impulsive Behavior Scale (SUPPS-P)***

The SUPPS-P is an abbreviated 20-item scale (Cyders et al., 2014), adapted from the original 59 item UPPS-P measure (Lynam et al., 2007). The SUPPS-P evaluates five facets of impulsivity (four items per dimension) which includes: positive urgency, negative urgency, (lack of) perseverance, (lack of) premeditation, and sensation seeking. Items are rated on a 4-point Likert scale (i.e., "agree strongly" to "disagree strongly"). The SUPPS-P has a similar factor structure to the original UPPS-P, and all facets on the SUPPS-P have demonstrated acceptable internal consistency (ranging from 0.74 to 0.85) (Cyders et al., 2014) (see Appendix D for specific items). In this study, the SUPPS-P subscales demonstrated acceptable internal consistency (Cronbach's alpha's between .66 and .79).

***Compulsive Sexual Behavior Inventory (CSBI-13)***

The Compulsive Sexual Behavior Inventory-13 (CSBI-13; Miner et al., 2017) is a 13-item questionnaire that assesses compulsive sexual behavior symptomology from 1=never to 5=frequently (scores range from 13 to 65). Previous research has indicated that the CSBI-13 shows strong internal consistency, content validity, and criterion-related validity (Coleman et al., 2019). A score of 30 or above is indicative of a positive screen for compulsive sexual behavior disorder (Miner et al., 2017) (see Appendix E for specific items). In this study, the CSBI-13 demonstrated good internal consistency (Cronbach's alpha=.88).

***Body Mass Index (BMI)***

Participants were asked to report their height (i.e., feet, inches or meters, centimeters) and weight (pounds or kilograms). BMI was calculated (weight [in pounds]/height [in inches] squared) using participant's self-reported measurements. I used The Centers for Disease Control and Prevention (CDC) guidelines to establish the cutoffs for underweight, normal, overweight, and obese groupings. The categories were as follows: underweight (BMI less than or equal to 18.5), normal (BMI between 18.5 and 25), overweight (BMI between 25 and 30), and obese (BMI greater than 30).

**US Community Participants (Sample 2)**

Data for this project was also part of an international and multi-lab study from 45 countries called the *International Sex Survey* (ISS) (Bőthe et al., 2021). The ISS attempted to recruit a 1:1 ratio of men and women, in addition to intentionally including sexual and sex/gender diverse individuals. In addition, this project used a cross-sectional method of self-report surveys, and participants were recruited through advertisements on social media (e.g., Facebook [restricted by IP address]) and the *Las Vegas Review-Journal*. Approximately $7,000 was allocated on ads across the United States. Participants completed the self-report survey on a secure online platform (i.e., Qualtrics Research Suite). Study procedures were approved by each country's Institutional Review Boards. Completion of the study survey took approximately 30-45 minutes and after every completed survey, participants were informed that study collaborators would donate 50 cents to non-profit international organizations (e.g., World Association for Sexual Health) with a maximum donation of $1,000. The ISS began data collection in October 2021 and was completed in May 2022. My dissertation only used data from the US participants who completed the ISS and included 2,055 participants.

**Measures for Community Sample**

### *Demographics*

A sociodemographic questionnaire was used to obtain information on biological sex, age, socioeconomic situation, relationship status, highest educational level obtained, BMI, and minority status (see Appendix F).

### *Binge Eating Disorder Screener-7 (BEDS-7)*

The Binge Eating Disorder Screener-7 (BEDS-7; Herman et al., 2016) is a seven-item self-report measure used to identify participants who endorse probable risk for BED within the past three months, based on the DSM-5 diagnostic criteria for BED. The BEDS-7 is a screening measure that is not used for diagnostic purposes, and individuals who screen positive should be referred to a specialist for a formal diagnosis of BED (Herman et al., 2016). The first two items on the BEDS-7 are rated on a "yes" or "no" dichotomous scale. The remaining five questions inquire about the features of the bingeing episodes (as per the criteria of BED in the DSM-5-TR; APA, 2022) and are rated on a four-point scale (i.e., 0=never or rarely; 3=always). The psychometric properties of the BEDS-7 have not been evaluated extensively, but initial evidence suggests that the BEDS-7 demonstrates face and content validity (Herman et al., 2016). However, due to our community sample being a non-clinical sample, for the community sample statistical analyses, I used a continuous total score for the seven BEDS-7 items. Total scores ranged from 0 to 17 (see Appendix G). In this study, the BEDS-7 demonstrated excellent internal consistency (Cronbach's alpha=.93).

### *P4 Suicidality Screener*

The P4 is a 4-item screening measure used to assess suicide risk (Dube et al., 2010). The four questions inquire about suicidal history, plan, probability, and preventive factors. Participants can be classified into minimal, lower, and higher risk categories depending on their

responses (see Appendix H). The validity and reliability of the P4 has been established as part of a 42-country study (Gewirtz-Meydan et al., 2024), suggesting it has adequate reliability, convergence, and discriminant validity, and a cutoff score of 1 is recommended to identify individuals at risk of suicidal behavior. In this study, the P4 was measured continuously (total scores ranging from 0-4) and demonstrated adequate internal consistency (Cronbach's alpha=.70).

***Brief Symptom Inventory-12 (BSI-12)***

The Brief Symptom Inventory-12 (BSI-12) was used to assess symptoms of depression and anxiety (Quintana et al., 2024). This measure comprises 12 items taken from the 18-item Brief Symptom Inventory (BSI; Derogatis, 2001). The BSI-18 asked participants to rate their level of distress over the past seven days and is scored on a five-point scale (0=not at all; 4=extremely), and then summed for each subscale. The BSI-18 contains three symptom subscales (i.e., Somatization, Depression, Anxiety) with six items asked for each scale. The BSI-12 was created similarly, with the only difference being that the BSI-12 only collects data for the depression and anxiety subscales (Quintana et al., 2024). Higher scores on the BSI-12 are indicative of higher levels of psychological distress. BSI-12 internal consistency estimates have been found to be strong (.90 and above for both subscales), and the measure is a valid and reliable tool to use across languages, countries, sexual orientation, and genders (Quintana et al., 2024). In addition, a psychopathology composite was created combining the BSI-12 and P4 Suicidality screener (see Appendix H for these measures). In this study, the BSI-12 subscales of anxiety and depression demonstrated excellent internal consistency (Cronbach's alpha=.91 each). The psychopathology composite combining the BSI-12 and P4 also demonstrated excellent internal consistency (Cronbach's alpha=.92).

***Short form Urgency, Premeditation (lack of), Perseverance (lack of), Sensation Seeking, Positive Urgency, Impulsive Behavior Scale (SUPPS-P)***

The SUPPS-P is an abbreviated 20-item scale (Cyders et al., 2014), adapted from the original 59 item UPPS-P measure (Lynam et al., 2007). The is the same self-report scale used with the college sample (see Appendix I). In this study, the SUPPS-P subscales demonstrated adequate internal consistency (Cronbach's alpha's between .70-.88).

***Compulsive Sexual Behavior Disorder Scale (CSBD-19)***

The Compulsive Sexual Behavior Disorder Scale (CSBD-19) is a valid and reliable, 19-item measure based on ICD-11 diagnostic guidelines for CSBD (Bőthe et al., 2020). The CSBD-19 contains five factors: c*ontrol*, *salience*, *relapse*, *dissatisfaction,* and *negative consequences*. Responses are scored on a 4-point Likert scale with 1="totally disagree", 4 "totally agree". Scores of 50 or above indicate a substantial risk for compulsive sexual behavior disorder (see Appendix J). Based on initial psychometric testing, the CSBD-19 presents with strong construct and convergent validity, and adequate reliability (Bőthe et al., 2020, Bőthe et al., 2023). In this study, the CSBD-19 demonstrated excellent internal consistency (Cronbach's alpha=.90).

***Body Mass Index (BMI)***

Participants were asked to report their height (i.e., feet, inches or meters, centimeters) and weight (pounds or kilograms). BMI was calculated identically to what has been described previously for the college sample (see Appendix K for a comparison of sample measures).

# Chapter 4 - Analytic Plan

## Statistical Analyses (Sample 1: College Student Sample)

### *Data Preparation*

Participants missing more than 30% of data on study variables were excluded from data analyses. This resulted in the removal of 14 out of 2,175 participants (0.64% of participants) from this sample. The overall sample size after removing participants was 2,161. To adjust for multiple statistical tests, the p-value for significance was set at $p<.01$ for all statistical analyses.

### *Descriptive Statistics*

Basic descriptive analyses for the sociodemographic variables (i.e., age, sex, BMI, race/ethnicity, sexual orientation) and study variables (i.e., SUPPS-P subscales, CSBI-13, EDE-Q, DSM-5 cross cutting measure depression, anxiety, suicidal ideation, and substance use) were calculated for the means, frequencies, and standard deviations for the college student sample. In addition, I examined skewness and kurtosis for all study variables in the college sample. Data is deemed to be normal when skewness falls between -2 and +2 and kurtosis falls between -7 and +7 (Ryu, 2011).

### *Chi-square, T-tests, and MANOVAS*

First, comparisons between the college and the community sample were performed, using between subjects *t*-tests to analyze differences in shared sociodemographic variables and the SUPPS-P.

To identify covariates for the college student sample, I conducted a series of chi-squares of independence tests to determine whether there were any significant differences on sociodemographics (i.e., sex, race/ethnicity, BMI, sexual orientation) between individuals with

and without clinically significant disordered eating symptoms as determined by the suggested clinical cut-off score derived from the EDE-Q total score.

Next, I conducted a series of unadjusted one-way MANOVAs to determine if there were any significant differences in categorical sociodemographics (i.e., sex, race/ethnicity, BMI, sexual orientation) for the two SUPPS-P subscales used in later mediation analyses (i.e., negative urgency, and positive urgency). Any significant relationships with categorical sociodemographic variables were noted and adjusted for in subsequent mediation analyses. For all chi-square tests and MANOVAs, I included relevant effect size measures.

***Pearson Correlations***

Next, using SPSS 28.0 (SPSS, Inc. Chicago, IL), I conducted Pearson Product-Moment correlations to calculate the associations for the SUPPS-P subscales, and the following variables: age, EDE-Q total score, compulsive sexual behavior (CSBI-13), depression, anxiety, the suicidal ideation subscale of the DSM-5 cross-cutting measure, a psychopathology composite, and past year substance use (alcohol, marijuana, vape/e-cigarettes, and cigarettes/chewing tobacco) as indicated by the DSM-5 Level 2 substance use measure.

***Mediation Analyses***

For Aim 1, I first conducted mediation analyses to examine whether trait impulsivity (SUPPS-P negative urgency or SUPPS-P positive urgency) would mediate the relationship between disordered eating behaviors (EDE-Q total scores) and psychopathology (combining scores on the DSM-5 cross-cutting measure subscales for depression, anxiety, and suicidal ideation), while adjusting for any relevant sociodemographic variables indicated by previous analyses. Thus, these analyses examined the hypothesis (H1) that impulsivity mediated the relationship between disordered eating and psychopathology. The mediation analysis used the R

package lavaan (Rosseel, 2012) to test the indirect effect of trait impulsivity on the relationship between disordered eating and psychopathology. Pathway a represented the effect of disordered eating on trait impulsivity. Pathway b represented the effect of trait impulsivity on psychopathology partialling out the effect of disordered eating. Pathway c' represented the direct effect of disordered eating on psychopathology partialling out the effect of trait impulsivity. I quantified and tested the statistical significance of the indirect effect of disordered eating on psychopathology through trait impulsivity by calculating the product of the coefficients a and b. The total effect was the sum of direct (c') and indirect effects (a*b). The positive and negative urgency SUPPS-P subscales were used as mediators due to previous research more consistently indicating associations with disordered eating and the urgency subscales.

For Aim 2, I used exploratory mediation analyses to examine if trait impulsivity (SUPPS-P negative or positive urgency) would mediate the relationship between disordered eating (EDE-Q total scores) and compulsive sexual behavior (as measured by the CSBI-13 total scores), while adjusting for any relevant sociodemographic variables indicated by previous analyses. Thus, these analyses examined whether impulsivity mediated the relationship between disordered eating and compulsive sexual behavior. The pathways were similar to what was described earlier, with compulsive sexual behavior replacing psychopathology in the mediation analyses. Overall, four different mediation models were tested for the college student sample. For these models, standardized path coefficients and their significance values will be reported for both direct and indirect effects to give a common metric for interpretation of results. Last, I used Cohen's (1988) guidelines to describe the size of the effect sizes (i.e., small=0.2, medium=0.5, large=0.8).

**Statistical Analyses (Sample 2: Community Sample)**

### *Data Preparation*

Participants missing more than 30% of data on study variables were excluded from data analyses. This resulted in the removal of 157 out of 2,055 participants (7.64% of participants) from this sample. The overall sample size after removing participants was 1,898. To adjust for multiple statistical tests, the p-value for significance was set at $p<.01$ for all statistical analyses.

### *Descriptive Statistics*

Within the community-based sample, basic descriptive analyses for the sociodemographic variables (i.e., sex, age, sexual orientation, perceived socioeconomic situation, relationship status, educational level obtained, BMI, and minority status) and study variables (i.e., SUPPS-P subscales, CSBD-19, BEDS-7, P4, BSI-12) were calculated to determine means, frequencies, and standard deviations. In addition, I examined skewness and kurtosis for all study variables in the community sample.

### *MANOVAS*

To identify covariates, I conducted a series of unadjusted one-way MANOVAs to determine whether there were any differences on sociodemographics (i.e., sex, perceived socioeconomic situation, relationship status, education, BMI, and minority status) and the two SUPPS-P subscales that were used in later mediation analyses (i.e., negative urgency, and positive urgency). Any significant relationships with sociodemographic variables were adjusted for in subsequent mediation analyses. I included relevant effect size measures for the MANOVAs.

### *Pearson Correlations*

I then conducted Pearson Product-Moment correlations on SPSS 28.0 (SPSS, Inc. Chicago, IL) to calculate bivariate associations for the SUPPS-P subscales, and the following

variables: age, the BEDS-7, compulsive sexual behavior (CSBD-19), suicidality (P4), BSI-12 subscales of depression and anxiety, and a psychopathology composite.

### *Mediation Analyses*

For Aim 1, I conducted mediation analyses to examine whether trait impulsivity (SUPPS-P negative urgency or SUPPS-P positive urgency) would mediate the relationship between binge eating symptoms (BEDS-7 total scores) and psychopathology (combining scores on BSI-12 anxiety and depression subscales and the P4 suicidality screener), while adjusting for any relevant sociodemographic variables indicated by previous analyses. Thus, these analyses examined the hypothesis (H1) that impulsivity mediated the relationship between disordered eating and psychopathology. The mediation analysis used the R package lavaan (Rosseel, 2012) to test the indirect effect of trait impulsivity on the relationship between binge eating symptoms and psychopathology. Pathway a represented the effect of binge eating symptoms on trait impulsivity. Pathway b represented the effect of trait impulsivity on psychopathology partialling out the effect of binge eating symptoms. Pathway c' represented the direct effect of binge eating symptoms on psychopathology partialling out the effect of trait impulsivity. I quantified and tested the statistical significance of the indirect effect of binge eating symptoms on psychopathology through trait impulsivity by calculating the product of the coefficients a and b. The total effect was the sum of direct (c') and indirect effects (a*b). Once again, the positive and negative urgency SUPPS-P subscales were used as mediators due to previous research more consistently indicating associations with disordered eating and the urgency subscales.

For Aim 2, I conducted exploratory mediation analyses examine whether trait impulsivity (SUPPS-P negative or positive urgency) would mediate the relationship between binge eating symptoms (BEDS-7 total scores) and compulsive sexual behavior (as measured by the CSBD-19

total scores), while adjusting for any relevant sociodemographic variables indicated by previous analyses. Thus, these analyses examined whether impulsivity mediated the relationship between disordered eating and compulsive sexual behavior. The pathways were similar to what have been described earlier, with compulsive sexual behavior replacing psychopathology in the mediation analyses.

Overall, four different mediation models were tested in each sample. I again reported standardized coefficients and used Cohen's (1988) guidelines to describe the size of the effect sizes (i.e., small=0.2, medium=0.5, large=0.8). These analyses mirrored the structure of mediation analyses used in the college sample but used different measures for the psychopathology composite and binge eating symptoms.

# Chapter 5 - Results

## Sample 1: College Sample

### *Descriptive Statistics*

Prior to statistical analyses, the means, standard deviations, skewness, and kurtosis of all study variables were examined (see Table 1). All study variables were in the normal range for skewness ($\pm$2) and kurtosis ($\pm$7), except for substance use sum score (3.09) and suicidal ideation (2.676) being moderately positively skewed, in addition to age (4.75) being substantially positively skewed. Due to the large student sample size and because no data used in the primary and exploratory analyses were substantially skewed, no data transformations were performed.

After deletion of participants missing more than 30% of data on study variables, there was an overall total of 2,161 participants. There was minimal missing data on variables included in analyses: CSBI-13 total score (*n*=2,156, 0.2%), BMI (*n*=2,021, 6.5%), suicidality (*n*=2,156, 0.2%), depression (*n*=2,159, 0.1%), anxiety (*n*=2,159, 0.1%), psychopathology composite (*n*=2,156, 0.2%), EDE-Q total score (*n*=2,161, 0%), substance use frequency (*n*=2,121, 1.9%), SUPPS-P negative urgency (*n*=2,155, 0.3%), SUPPS-P positive urgency (*n*=2,155, 0.3%), SUPPS-P sensation seeking (*n*=2,155, 0.3%), SUPPS-P (lack of) perseverance (*n*=2,156, 0.2%), and SUPPS-P (lack of) premeditation (*n*=2,155, 0.3%).

### *Chi-square, T-tests, and MANOVAS*

A chi-square test of independence revealed that the group classified as having disordered eating had a significantly higher proportion of men compared to the non-disordered eating group ($x^2$=109.06, *p<.001, Cramer's V=0.23*). A separate chi-squared test of independence also revealed that the disordered eating group had a significantly higher proportion of individuals

who were heterosexual compared to the non-clinical group ($x^2$=17.50, *p=.001, Cramer's V=0.09*). Moreover, there was a significant relationship between BMI and eating group status. Individuals in the non-disordered eating group were more likely to be at a healthy weight than individuals in the disordered eating group, ($x^2$=105.4, *p<.001, Cramer's V=0.23*). Last, a final chi-squared test of independence showed that race was not significant when evaluated by eating group status ($x^2$=.02, *p=.89, Cramer's V=0.003*). Table 6 shows the chi-square analyses.

Four separate one-way MANOVAs were conducted to determine whether there was a difference between sociodemographic variables (i.e., sex, sexual orientation, race, BMI category) and SUPPS-P negative and positive urgency scores. There was a significant difference by sex on SUPPS-P positive urgency scores, *F*(2, 2154)=31.77, *p*<.001, partial eta squared=.015. However, there was no significant difference by sex on SUPPS-P negative urgency scores, *F*(2, 2154)=1.33, *p*=.25, partial eta squared=.007. In addition, there was a significant difference by sexual orientation on both SUPPS-P negative urgency, *F*(2, 2147)=5.24, *p*=.01, partial eta squared=.007 and SUPPS-P positive urgency *F*(2, 2147)=6.60, *p*<.001, partial eta squared=.003. Furthermore, there was not a significant difference by race on SUPPS-P positive urgency scores, *F*(2, 2159)=4.11, *p*=.043, partial eta squared=.002, or by race on SUPPS-P negative urgency scores *F*(2, 2159)=03, *p*=.854, partial eta squared=.00. Lastly, there was no significant difference for BMI category on positive or negative SUPPS-P score *F*(4, 2017)=1.85, *p*=.086, partial eta squared=.003). See Table 5 for the full MANOVA results.

Due to their significant relationship with either EDE-Q scores or SUPPS-P scores, sex, BMI, and sexual orientation, were adjusted for in later mediation analyses including the SUPPS-P positive urgency subscale as a mediator. The same three variables (sex, BMI, and sexual

orientation) were also adjusted for in mediation analyses using the SUPPS-P negative urgency subscale as a mediator.

***Pearson Correlations***

I conducted Pearson correlations to calculate the associations for the SUPPS-P subscales, and the following variables: age, EDE-Q total score, compulsive sexual behavior (CSBI-13), depression, anxiety, the suicidal ideation subscale of the DSM-5 cross-cutting measure, a psychopathology composite of depression, anxiety, and suicidal ideation, past year frequency of substance use (i.e., alcohol, marijuana, vape/e-cigarettes, and cigarettes/chewing tobacco) as indicated by the DSM-5 Level 2 substance use measure, and BMI (see Table 3). In general, the SUPPS-P showed significant associations with other study variables (see Table 4 for correlations specifically with SUPPS-P variables).

***Mediation Analyses***

To test Aim 1, I employed two different mediation models to examine the relationship between a psychopathology composite (dependent variable), negative or positive urgency SUPPS-P subscale score (mediator variable), and EDE-Q total score (independent variable). BMI, sex, and sexual orientation were adjusted for in both mediation analyses.

As shown in Figure 1, pathways a and b were significant when testing disordered eating (independent variable), psychopathology (dependent variable), and SUPPS-P negative urgency (mediator). A higher score for disordered eating was associated with increased SUPPS-P negative urgency (pathway a, $\beta$=.31), and increased SUPPS-P negative urgency was associated with increased psychopathology (pathway b, $\beta$=.25). Consistent with H1, the indirect mediation effect of disordered eating on psychopathology through SUPPS-P negative urgency was also significant ($p$<.001). For the second mediation analysis using SUPPS-P positive urgency as a

mediator, pathways a and b were significant (see Figure 2). A higher score for disordered eating was associated with increased SUPPS-P positive urgency (pathway a, $\beta$=.16), and increased SUPPS-P positive urgency was associated with increased psychopathology (pathway b, $\beta$=.13). Consistent with H1, I also found the indirect mediation effect of disordered eating on psychopathology through SUPPS-P positive urgency was significant ($p$<.001).

As shown in Figure 3, pathways a and b were significant when testing disordered eating (independent variable), compulsive sexual behavior (dependent variable), and SUPPS-P negative urgency (mediator). A higher score for disordered eating was associated with increased SUPPS-P negative urgency (pathway a, $\beta$=.31), and increased SUPPS-P negative urgency was associated with increased compulsive sexual behavior (pathway b, $\beta$=.31). Moreover, the indirect mediation effect of disordered eating on compulsive sexual behavior through SUPPS-P negative urgency was also significant ($p$<.001). For the other mediation analysis using SUPPS-P positive urgency as a mediator, pathways a and b were significant. A higher score for disordered eating was associated with increased SUPPS-P positive urgency (pathway a, $\beta$=.16), and increased SUPPS-P positive urgency was associated with increased compulsive sexual behavior (pathway b, $\beta$=.25) (see Figure 4). In addition, the indirect mediation effect of disordered eating on compulsive sexual behavior through SUPPS-P positive urgency was significant ($p$<.001).

**Sample 2: Community Sample**

***Descriptive Statistics***

Prior to statistical analyses, the means, standard deviations, skewness, and kurtosis of all study variables were examined (see table 2). All study variables were in the normal range for skewness ($\pm$2) and kurtosis ($\pm$7).

After deletion of participants missing more than 30% of data on study variables, there was an overall total of 1,898 participants. There was minimal missing data on variables included in analyses: CSBD-19 total score (*n*=1,888, 0.5%), BMI (*n*=1,804, 5%), suicidality (*n*=1,833, 3.4%), depression (*n*=1,897, 0.1%), anxiety (*n*=1,898, 0%), psychopathology composite combining depression and anxiety (*n*=1,897, 0.1%), BEDS-7 total score (*n*=1,827, 3.7%), SUPPS-P negative urgency (*n*=1,895, 0.2%), SUPPS-P positive urgency (*n*=1,895, 0.2%), SUPPS-P sensation seeking (*n*=1,895, 0.2%), SUPPS-P (lack of) perseverance (*n*=1,896, 0.1%), and SUPPS-P (lack of) premeditation (*n*=1,896, 0.1%).

***MANOVAS***

Four separate unadjusted one-way MANOVAs were conducted to determine whether there was a difference between categorical sociodemographic variables (i.e., sex, sexual orientation, minority status, BMI category) and SUPPS-P negative and positive urgency scores. There was a significant difference by sex on SUPPS-P negative urgency, $F(2, 1894)=21.65$, $p<.001$, partial eta squared=.011. There was also a significant difference by sex on SUPPS-P positive urgency scores, $F(2, 1894)=15.83$ $p<.001$, partial eta squared=.008. In addition, there was a significant difference by sexual orientation on SUPPS-P positive urgency, $F(2, 1,894)=21.27$ $p<.001$, partial eta squared=.011; however, there was no significant difference by sexual orientation on SUPPS-P negative urgency $F(2, 1,894)=3.55$, $p=.06$, partial eta squared=.002. Finally, there was no significant difference by minority status or BMI category on positive or negative SUPPS-P scores. See Table 9 for the full MANOVA results.

Due to their significant relationship with SUPPS-P scores, sex, and sexual orientation were adjusted for in later mediation analyses including the SUPPS-P positive urgency subscale

as a mediator. However, only sex was adjusted for in mediation analyses using the SUPPS-P negative urgency subscale as a mediator.

***Pearson Correlations***

Pearson correlations were conducted on the SUPPS-P subscales, and the following variables: age, BMI, binge eating (BEDS-7), compulsive sexual behavior (CSBD-19), suicidality (P4), depression and anxiety (BSI-12 subscales), and a psychopathology composite (combining the suicidality, depression, and anxiety measures) (see Table 7). In general, the SUPPS-P subscales were significantly associated with all study variables. See Table 8 for specific correlations of the SUPPS-P subscales and other study variables.

***Mediation Analyses***

To address Aim 1 for the community sample, I employed two different mediation models to examine the relationship between a psychopathology composite (dependent variable), negative or positive urgency SUPPS-P subscale score (mediator variable), and BEDS-7 total scores (independent variable). Sex, and/or sexual orientation were adjusted for in mediation analyses.

As shown in Figure 5, pathways a and b were significant when testing binge eating symptoms (independent variable), psychopathology (dependent variable), and SUPPS-P negative urgency (mediator). A higher score for binge eating symptoms was associated with increased SUPPS-P negative urgency (pathway a, $\beta$=.19), and increased SUPPS-P negative urgency was associated with increased psychopathology (pathway b, $\beta$=.28). Consistent with H1, the indirect mediation effect of + binge eating symptoms on psychopathology through SUPPS-P negative urgency was significant ($p$<.001). For the second mediation analysis using SUPPS-P positive urgency as a mediator, pathways a and b were significant (see Figure 6). A higher score for binge eating symptoms was associated with increased SUPPS-P positive urgency (pathway a, $\beta$=.19),

and increased SUPPS-P positive urgency was associated with increased psychopathology (pathway b, $\beta$=.25). Consistent with H2, I also found the indirect mediation effect of binge eating symptoms on psychopathology through SUPPS-P positive urgency was significant ($p$<.001).

As shown in Figure 7, pathways a and b were significant when testing binge eating symptoms (independent variable), compulsive sexual behavior (dependent variable), and SUPPS-P negative urgency (mediator). A higher score for binge eating symptoms was associated with increased SUPPS-P negative urgency (pathway a, $\beta$=.19), and increased SUPPS-P negative urgency was associated with increased compulsive sexual behavior (pathway b, $\beta$=.25). Moreover, the indirect mediation effect of binge eating symptoms on compulsive sexual behavior through SUPPS-P negative urgency was also significant ($p$<.001). For the other mediation analysis using SUPPS-P positive urgency as a mediator, pathways a and b were significant. A higher score for binge eating symptoms was associated with increased SUPPS-P positive urgency (pathway a, $\beta$=.19), and increased SUPPS-P positive urgency was associated with increased compulsive sexual behavior (pathway b, $\beta$=.30) (see Figure 8). In addition, the indirect mediation effect of binge eating symptoms on compulsive sexual behavior through SUPPS-P positive urgency was significant ($p$<.001).

**Sample Comparisons, Aim 3**

Independent sample *t*-tests compared the college and community samples on age, SUPPS-P subscale scores, and BMI. These comparisons are shown in Table 10.

The independent sample *t*-tests revealed significant differences between samples for age, BMI, SUPPS-P positive urgency, SUPPS-P negative urgency, and SUPPS-P lack of perseverance. The community sample had a significantly higher mean age ($M$=33.78, $SD$=14.98) than the college sample ($M$=19.95, $SD$=4.00), $t$(2,133.12)=38.86, $p$<.001, Cohen's $d$=1.29. In

addition, the community sample had a significantly higher mean BMI (*M*=27.9, *SD*=6.92) than the college sample (*M*=25.06, *SD*=5.87), *t*(3,553.54)=13.59, *p*<.001, Cohen's *d*=.44. The community sample also had significantly higher mean scores on SUPPS-P positive urgency (*M*=9.49, *SD*=2.63) and SUPPS-P lack of perseverance (*M*=7.89, *SD*=2.69), compared to the college sample (SUPPS-P positive urgency: *M*=7.87, *SD*=2.80, SUPPS-P lack of perseverance: *M*=6.87, *SD*=2.04), with *t*(4,031.13)=18.90, *p*<.001, Cohen's *d*=.59, and *t*(3,506.19)=13.46, *p*<.001, Cohen's *d*=.43, respectively. Lastly, the college sample had significantly higher mean scores on SUPPS-P negative urgency (*M*=9.26, *SD*=2.93), than the community sample (*M*=8.85, *SD*=3.03), *t*(4,049)=4.60, *p*<.001, Cohen's *d*=.15. There were no significant differences between samples in SUPPS-P sensation seeking and SUPPS-P lack of premeditation.

## Chapter 6 - Discussion

My dissertation's primary aim was to examine the interrelationships among trait impulsivity, disordered eating, compulsive sexual behaviors, and psychopathology. These relationships were evaluated in two different samples including: 1) a sample of US college students and 2) a community sample of adults across the US. The specific aims of this study were to 1) examine relationships amongst general psychopathology, impulsivity, and disordered eating, 2) conduct an exploratory aim to investigate relationships between disordered eating, impulsivity, and compulsive sexual behavior, and 3) compare sociodemographics, impulsivity, and disordered eating behaviors across two distinct US samples.

First, I used an identical analytic plan for both samples, in which I calculated descriptive statistics and correlations between sample variables. Next, to determine potential sociodemographic covariates, I used MANOVA and/or chi-square analyses to determine any associations between sociodemographic variables and impulsivity (in both samples) or disordered eating (in the college sample). Afterwards, to address Aim 1, I created mediation models to test for the influence of impulsivity and disordered eating on psychopathology, while adjusting for relevant sociodemographic variables. Within these models, impulsivity was the mediator, a psychopathology composite was the dependent variable, and disordered eating was the independent variable. Following this, I addressed Aim 2 by creating exploratory mediation models that tested the influence of impulsivity on disordered eating and compulsive sexual behavior. The exploratory model used impulsivity as a mediator, compulsive sexual behavior as the dependent variable and disordered eating as the independent variable. In the following sections, I first discuss the results for the college sample, followed by the community sample, and then discuss sample comparisons and patterns of results across the samples (Aim 3). The

other sections will review study limitations/strengths, clinical implications and offer recommendations for future directions of research for both clinical and non-clinical populations.

**College Sample**

The college sample included 2,161 students who completed an online Qualtrics survey. These college students were recruited from introductory psychology courses that participated in online SONA subject pools at two different universities. The college students in my dissertation had a 19.1% prevalence rate of clinically disordered eating as classified by the EDE-Q measure (Fairburn & Beglin, 2008). In a study with similar sample characteristics (a racially diverse sample of young college students which included both men and women), the researchers found a higher disordered eating prevalence rate of 31.1% using the same EDE-Q measure that was used in my dissertation (Barrack, West, Christopher, & Pham-Vera, 2019). However, in an international review/meta-analyses of disordered eating screening measures in undergraduate college and university populations, the prevalence rate of disordered eating was 19.7%, which was close to the prevalence rate noted in my dissertation (Alhaj et al., 2022). My college sample's mean SUPPS-P scores for the five subscales were similar to a previous study investigating binge eating habits and impulsivity in a non-US university sample (Khoury et al., 2021). Furthermore, the SUPPS-P scales presented in this study were appropriately less than what was seen in a psychiatric sample of patients with differing mental health disorders (Dugré et al., 2019), which met expectations since the college sample was not a treatment seeking sample. Moreover, in the college sample both mean scores for depression and anxiety as measured by the DSM-5 Level 1 measure (American Psychiatric Association, 2013a) were less than what was previously reported in a study that examined the psychometric properties of the DSM-5 Level 1 measure subscales in a comparable college sample (Bravo et al., 2018).

Although, both of these samples had a similar mean score for the suicidal ideation subscale of the DSM-5 Level 1 measure (Bravo et al., 2018). Finally, the CSBI-13 has not been used to measure compulsive sexual behavior in a general sample of college students, but U.S. adults recruited online through Amazon's Mechanical Turk presented with a higher mean compulsive sexual behavior score (as measured by the CSBI-13) than the college students in this study (Rahm-Knigge, Gleason, Mark, & Coleman, 2023).

The primary aims of my dissertation focused on the urgency subscales of the SUPPS-P impulsive behavior scale to investigate relationships between psychopathology, urgency, disordered eating, and compulsive sexual behaviors. Urgency consists of two facets, including negative urgency (i.e., the tendency to engage in impulsive behaviors or reactions when experiencing negative affect) and positive urgency (i.e., the tendency to engage in impulsive behavior or reactions when experiencing positive affect) (Lynam et al., 2007). Past research has consistently shown that both urgency subscales have strong relationships with disordered eating, compulsive sexual behaviors, and overall psychopathology (Anestis et al., 2009; Berg et al., 2015; Garner et al., 2022; Kenny et al., 2019; Lynam et al., 2007; Stojek et al., 2014). Since these variables have shown a strong relationship with the urgency subscales in prior research, I decided to only include the negative and positive urgency subscales in the main analyses of my dissertation. This decision was also influenced by my desire to maintain parsimony within the statistical analyses and to reduce the number of mediation analyses to only those specific to my proposed hypotheses.

The mediation models in the college student sample supported the hypothesis that impulsivity (both negative and positive urgency) mediated the relationship between disordered eating and psychopathology (Aim 1). This is a unique finding, since past research looking at

impulsive traits and disordered eating typically looked at these variables within clinical and/or treatment seeking populations (Boswell & Grilo, 2021; Lilenfeld et al., 1997; Manasse et al., 2016; Wonderlich et al., 2005). The direct effect of disordered eating on general psychopathology was also significant. In addition, Aim 2's exploratory analyses found similar patterns of results with significant associations between disordered eating, compulsive sexual behaviors, and impulsivity. Past literature suggests that disordered eating symptoms relate to psychological distress, psychopathology symptoms, and externalizing and internalizing psychopathology problems (Darby, Hay, Mond, Rodgers, & Owen, 2007; Herpertz-Dahlmann et al., 2008; Pauli-Pott, Becker, Albayrak, Hebebrand, & Pott, 2013). Yet, these previous studies contained samples of adolescents, and/or overweight or obese populations in contrast to the college sample examined in my dissertation. The finding in this study of a direct relationship between general disordered eating and psychopathology adds valuable data that indicates this relationship is also relevant in college students.

Frequently, college students present with higher rates of psychiatric than their non-college attending peers, and this may increase the potential rate of college students to experience comorbid mental health conditions (Blanco et al., 2008). Consequently, results from the present study indicate that exploring impulsivity and eating disorders in American college samples is relevant and needed, in addition to evaluating appropriate treatment options and barriers to receiving mental health care in college samples. Impulsive traits may be particularly concerning in college students, as this is often a period in their life span where there is more risk taking overall (Arnett, 1998). In general, emerging adulthood (ages 19-29 years) is a pertinent age period to assess for risk taking, because emerging adulthood is when risk taking is most prevalent across life domains, though this is dependent on the type of risk taking (Willoughby,

Heffer, Good, & Magnacca, 2021). Evidence from this study indicates that negative or emotional states are of relevance and consideration when assessing impulsive traits and potential risk taking in this population.

**Community Sample**

Participants from the community sample of 1,898 US adults completed an online Qualtrics survey. This sample was recruited as part of an international and multi-lab study from 45 countries called the *International Sex Survey* (ISS), although my dissertation only used data from the US participants (Bőthe et al., 2021). In the community sample, I specifically measured binge eating symptoms, rather than general disordered eating behaviors. Women in the community sample had higher mean scores than men on the BEDS-7 measure of binge eating symptoms. This result was similar to previous research that showed women had higher prevalence rates of BED, and binge eating symptoms compared to men (Erskine, & Whiteford, 2018; Smith, Farstad, & von Ranson, 2021; Udo and Grilo, 2018). The BSI-12 measured anxiety and depression in this study, but this measure has typically been used with specific samples (e.g., treatment seeking, college samples, older adults), and there was no direct comparison to a national representative US sample that used this measure. Nonetheless, one study used the BSI-18 anxiety and depression subscales (identical to the BSI-12 measure used in this study) in a nationally representative German sample (aged 14-94) and had lower anxiety and depression subscale scores in comparison to the US community sample used in this study (Franke et al., 2017). These differences could be explained by the recruitment protocol for the general sample which intentionally included sexual and sex/gender diverse individuals, who may have been a higher overall risk for mental health concerns. Like the BSI-12, the CSBD-19 (Bothe et al., 2020) has not been assessed in a representative US community sample by non-ISS related

research studies. However, when evaluating the CSBD-19 mean total score for compulsive sexual behavior, the community sample in this study showed comparable mean scores to previous research on a nationally representative sample of Polish adults (Lewczuk et al., 2022). Finally, there was no relevant comparison for the mean P4 suicidality score as no previous research was found that scored this measure continuously, which remains a limitation of using this measure.

The models in the community sample once again showed that impulsivity (both negative and positive urgency) mediated the relationship between disordered eating and psychopathology (Aim 1). The direct effect between disordered eating and psychopathology was also significant and supported previous research which has shown a relationship between binge eating symptoms and overall psychopathology (Latner, Hildebrandt, Rosewall, Chisholm, & Hayashi, 2007). Lastly, Aim 2's exploratory analyses again found similar patterns of results with significant associations between disordered eating, compulsive sexual behaviors, and impulsivity.

The finding of strong interrelationships among impulsivity, disordered eating, and psychopathology in the community sample is important to note, as this may mean that these traits are worth investigating in non-clinical community populations. For example, exploring this population's psychopathology, disordered eating, and impulsivity severity is needed to ensure that we develop appropriate prevention efforts and establish treatment options for individuals with clinical or subthreshold mental health concerns. It is still currently unclear whether one of these factors is more impactful on clinical outcomes of eating disorders, and establishing a clearer understanding of these relationships in dual diagnosis populations presenting with these concerns will help treatment efforts.

Within a general sample, there may be individuals who may not meet criteria for clinical diagnoses of eating disorders (e.g., binge eating disorder, bulimia nervosa, or anorexia nervosa) but may still benefit from mental health supports (e.g., abbreviated treatments, peer supports, online self-help services, etc.) or positive nutritional information. Indeed, subthreshold mental health diagnoses are relevant to consider, especially with eating disorders, as past research suggests that subthreshold levels of eating disorders can still be problematic and may lead to development of eating disorder diagnoses (Crow et al., 2002; Stice et al., 2010). Findings from the community sample support these past findings and reiterate the necessity of measuring subthreshold eating disorders.

**Sample Comparisons and Patterns of Results (Aim Three)**

The two samples included in this study differed in their characteristics and recruitment methods. The samples diverged in their sample types (US college students vs a community sample of US adults) as well. While the two samples did not use identical measures, there were measures across these samples that evaluated the same constructs. The following paragraphs compare the two samples on their sociodemographics, disordered eating, and trait impulsivity (Aim 3).

The descriptive statistics showed that the college sample presented with a younger mean age, a higher percentage of individuals reporting a heterosexual sexual orientation, a higher percentage of minority racial status, and a higher percentage of women than the community sample. The differences across samples in age and sex were expected due to the college sample encompassing young adults (typically 18-20 years of age), taking intro psychology courses (psychology classes tend to have larger percentages of women). The large difference between samples in percentage of participant's identifying with a heterosexual sexual orientation were

surprising as estimates of heterosexual sexual orientation in the US are around 88% percent for the general US sample (Pew Research Center, 2022). However, possible sample differences may be explained by the recruitment protocol for the community sample which attempted to recruit a 1:1 ratio of men and women, in addition to intentionally including sexual and sex/gender diverse individuals. The college sample had a higher level of individuals classifying themselves as racial minority status compared to the community sample, which was expected due to the college sample containing a pool of diverse campus student populations. Lastly, the college sample presented with a lower mean BMI than the community sample, which matches expectations, as the prevalence of obesity status increases in US adults as they age into middle and later adulthood (Mizuno, Shu, Makimura, & Mobbs, 2004; Stierman et al., 2021).

Clinical levels of disordered eating were also evaluated by sex in the college sample. Interestingly when evaluating EDE-Q disordered eating by sex in the college sample, results indicated that 32.57% of males were classified as having clinical levels of disordered eating, compared to the females' disordered eating prevalence rate of 13.32%. The BEDS-7 measure was used in the community sample to measure binge eating behavior and had a different pattern of results in comparison to the college sample. The BEDS-7 has not been evaluated with clinical cutoffs and as such, I did not create a clinical disordered eating group for this community sample. Nonetheless, when comparing BEDS-7 mean scores by sex for the community sample, it was shown that women ($M$=2.92, $SD$=4.71) had higher mean scores than men ($M$=1.58, $SD$=3.32). The results in the college sample were surprising given that previous research consistently supports that women are at a higher risk of developing disordered eating habits and/or eating disorders partly due to a disproportionate focus and pressure on women to reach a "thin ideal" (Culbert et al., 2015). The results seen in the college sample could be explained by

the different cutoffs for EDE-Q clinical status used in this study (4.00 or higher for women, and 1.68 or higher for men), and it could be that these cutoffs may need to be adjusted. Specifically, the prior research that established a cutoff of 1.68 for EDE-Q clinical scores found discriminant validity in using the EDE-Q with men, but this study did not have the racial diversity that was found in my dissertation (Schaefer et al, 2018). Eating disorder research has shown that eating disorders can also impact young men (Habashy et al., 2023), but there is still a lack of research in this area on men compared to women (Gorrell & Murray, 2019). In fact, even to date many studies investigating disordered eating habits and/or eating disorders have samples containing only women, or samples in which women are the vast majority of these screened. This limits the generalizability of previous eating disorder studies, and the results in my dissertation support that we should begin to include men in future eating disorder related research given that men presented with high levels of clinically disordered eating habits.

The SUPPS-P measure was given to both the community and college sample. When comparing patterns of results across the two different samples, the community sample presented with higher mean levels of negative urgency and lack of perseverance compared to the college sample. Additionally, the college sample had a higher mean level of positive urgency compared to the community sample. Previous research suggests that impulsivity decreases after adolescence as individuals age and "mature out" (Littlefield et al., 2009; Littlefield et al., 2016), and these findings have been replicated by research using the full UPPS-P Impulsive Scale (Argyriou, Um, Wu, & Cyders, 2020). Further research by other researchers showed that when comparing college students and non-college attending adults, no significant differences were found across any UPPS-P subscales (Tran, Teese, & Gill, 2018). In contrast to these previous

findings, results were mixed within my dissertation when comparing differences in impulsivity across the two different samples.

Impulsivity has been established as a prevalent symptom across other mental health disorders such as ADHD, borderline personality disorder, and gambling disorder (APA, 2022). The current study found associations between trait impulsivity and disordered eating habits, and when considering previous research these data suggest that viewing impulsivity as a transdiagnostic factor across disorders may have clinical and research utility. Specifically, negative and positive urgency are two facets of impulsivity that are related to the maintenance and development of disordered eating habits, behavioral addictions, and substance use disorders (Berg et al., 2015; Bőthe et al., 2019; Gunn et al., 2018). A transdiagnostic conceptualization of impulsivity could encourage specific treatments for impulsive behaviors and help develop a better awareness and knowledge of the nature of impulsivity (Kozak et al., 2019). However, it is important to note that impulsivity is heterogeneous in nature, and further testing and theorizing is also needed to determine if a transdiagnostic view of impulsivity should focus on the broad, heterogenous construct of impulsivity or conversely examine a singular aspect of impulsivity trans-diagnostically (e.g., investigating negative and positive urgency across mental health disorders). Another consideration for a transdiagnostic conception of impulsivity will be probing the relationship between compulsive and impulsive behaviors in mental health disorders. Research implicates that both compulsive and impulsive behaviors play a role in the development of certain disorders (i.e., substance use), and it will be important to determine the role of these behaviors in other disorders where both impulsivity and compulsivity are implicated such as BED (Brooks et al., 2017).

Impulsivity is a broad construct that can be measured in many different ways within research studies, and the broadness of this construct can lead to unclear definitions and conceptualizations of impulsivity. My dissertation attempted to lessen these issues by focusing specifically on one aspect of impulsivity (trait) and focused the main statistical analyses on negative and positive urgency. The impulsive traits of negative and positive urgency have consistently shown associations with overall psychopathology, substance use, eating disorders, and compulsive sexual behaviors (Anestis et al., 2009; Berg et al., 2015; Bőthe et al., 2019; Gunn et al., 2018; Kenny, Singleton, & Carter, 2019). The relationship of negative urgency on disordered eating is not only through negative affect, with previous research finding that negative urgency is associated with binge and emotional eating, even after controlling for negative affect (Racine et al., 2013). The results of my dissertation add to this literature and support that urgency in combination with disordered eating have a strong relationship with overall psychopathology. These results are further strengthened by the findings in this study being consistent across sample type (community or college sample), aspect of urgency (negative or positive), and with different aspects of disordered eating (overall disordered eating or binge eating symptoms).

**Study Limitations and Strengths**

Despite the strengths of the current study, specific limitations of my dissertation should be noted. First, the study was cross-sectional and cannot determine temporal effects, and in addition the study used self-report data which has inherent problems in gaining truthful and accurate responding from participants. Specifically, I asked about sensitive topics such as sexual behaviors and disordered eating which may be at a high risk of getting socially desirable responses from participants. However, I attempted to minimize self-report concerns by providing

anonymous platforms for participants and eliminating participants with substantial amounts of missing data.

The second limitation was that I used measures across samples which were not identical, although I had similar variables across the samples. For example, compulsive sexual behavior was measured in both samples, but the CSBI-13 (Miner et al., 2017) was used in the college sample, while the CSBD-19 (Bőthe et al., 2020) was used in the community sample. As such, some differences across samples could be partly due to different measures being used in analyses.

A third limitation was that because the data used in my dissertation was from large sample sizes, it was highly statistically powered and due to this more likely to find significant effects. This should especially be noted when considering both samples used multiple statistical tests in their analyses. To address this limitation, I used alpha corrections throughout the statistical analyses, and aimed for parsimony within the analytic plan and subsequent analyses.

Last, a fourth limitation is this study was using BMI as an indicator of obesity. BMI is ideal for use in population-level studies; however, BMI is a problematic descriptor of obesity as BMI does not distinguish lean muscle from fat mass, which can lead to inaccuracies in obesity classification (Gurunathan & Myles, 2016). Overall, BMI does not accurately assess visceral fat and some individuals classified as being "obese" do not suffer from metabolic or health complications often associated with obesity (Gurunathan & Myles, 2016). Furthermore, researchers have argued that evaluating obesity with the usage of BMI is related to the stigmatization of obese individuals by both medical professionals and the general population (Tapking et al., 2020).

Current strengths should be noted in this study, including its unique aims, large sample sizes, inclusion of two different and diverse samples, and the consistency in results across samples. My dissertation adds unique findings to the literature by providing support for a potential dual relationship of impulsivity/disordered eating in two different samples. The data in this study indicates that both impulsivity and disordered eating influence psychopathology, and this is the first study to test these relationships in mediation models. No previous study examining this research area has included two large samples in their analyses, and most past studies were similar in that they used clinical samples rather than college or community samples. In addition, the included participants had minimal missing data.

Another strength of this study was its large sample size with two unique samples which reflect demographically different samples (e.g., young adults vs. adults across the lifespan). The exploratory analyses exploring the relationships between compulsive sexual behavior, impulsivity, and disordered eating also added meaningful information to a research area that has been rarely investigated to date. This pattern of results also held across the exploratory analyses in both samples and should be studied in more detail in future research. The inclusion of two samples enabled cross-sample comparisons and added to the richness of the results, as the data showed that these results generalized across both community and college samples. Many studies investigating disordered eating behaviors and eating disorders have focused on young, White, women even though minority groups and males are also impacted by eating disorders (Gorrell & Murray, 2019; Perez et al., 2021). A major strength of this study was the improvement upon past eating disorder research by including diverse samples with substantial amounts of men and ethnic minorities which remain a critical area of further study (Habashy et al., 2023). Lastly, the

study was very statistically well powered for its analyses due to the large sample sizes collected in both studies.

**Future Directions**

Results of this study indicate that both trait impulsivity and disordered eating are important to consider for future psychological assessment and diagnoses. Future research should more closely examine disordered eating habits (e.g., binge eating and overeating behaviors) that have been postulated to be more likely to be associated with negative and positive urgency traits. Many questions remain regarding if impulsivity as a general construct is associated with binge eating disorders, or if this relationship depends on the specific type of impulsivity (trait, decision making, response inhibition, etc.). Previous research focusing on trait impulsivity shows that negative urgency has a strong relationship with eating disorders (Kenny et al., 2019; Manwaring et al., 2011) and disordered eating symptoms (Anestis et al., 2009). In fact, several eating disorder samples have had elevated levels of negative urgency (Kenny et al., 2019; Manwaring et al., 2011). Moreover, negative urgency has been shown to impact treatment outcomes and has been a predictor of slower and less effective treatment outcomes for BED patients (Manasse et al., 2016). While most research to date exploring impulsivity and binge eating disorders has focused on impulsivity in BN (Bell & Newns, 2002; Lacey & Evans, 1986; Lilenfeld et al., 1997; Wonderlich et al., 2005), the more limited research currently available on BED and impulsivity suggests that general impulsivity is more impactful for patients with BED, rather than any specific impulsivity domain (Boswell & Grilo, 2021). Overall, further research is needed to clarify the specific associations of impulsive traits and aspects of impulsivity in binge eating disorder and subthreshold binge eating disorder.

Future research could also benefit from further investigation including impulsivity, CSBD (and pornography usage), and disordered eating all within one study, since these areas have been sparsely looked at together. Current research has found that compulsive sexual behaviors are associated with binge eating habits in US Veterans, but more evidence is needed to corroborate these findings in other, more general samples (Etuk et al., 2022). As sexual behaviors have been found to co-occur with eating disorders (Castellini et al., 2019), further research will need to investigate how impulsivity presents in co-morbid eating disorders and behavioral addictions (e.g., CSBD, gambling disorder, internet gaming disorder). For example, further work is needed to examine the prevalence and severity of impulsive traits (high/low urgency) within specific clinical (e.g., depression, anxiety) and eating disorders (binge eating, purging/bulimia).

**Clinical Implications**

The consistent relationships found in my dissertation between disordered eating symptoms, impulsivity, and psychopathology suggest that clinicians should inquire about impulsive traits when assessing for eating disorders. Data from my dissertation presents similar findings to past research which found that BN was associated with impulsivity (Lilenfeld et al., 1997; Wonderlich et al., 2005). BED and BN are both eating disorders that include binge and overeating behaviors in their diagnostic criteria, and asking individuals about impulsivity may be especially relevant within binge eating spectrum disorders in comparison to restrictive eating disorders (Dawe & Loxton, 2004). Research has shown that impulsivity is a potential factor in BED treatment, as negative urgency predicted slower and less positive treatment outcomes for BED patients, while BED patients' food-specific response inhibition predicted higher eating disorder pathology at baseline, post-treatment, and follow-up (Manasse et al., 2016). Further

research demonstrates that impulsivity could be directly related to treatments outcomes in BED patients, as reductions in trait impulsivity and rapid changes in trait impulsivity were associated with reductions in eating-disorder psychopathology within cognitive behavioral therapy (CBT) and pharmacological treatments of BED (Boswell, Gueorguieva, & Grilo, 2023). Treatment outcomes for BN patients may also be impacted by impulsivity, as individuals with BN who were classified as multi-impulsive had poorer outcomes at the end of a self-help treatment (Bell & Newns, 2002).

Individuals with high impulsivity and eating disorders may have specific clinical needs that require a combination of eating disorder and impulsivity-focused treatments. For example, this was evident in an impulsivity-focused treatment that used food cues and response prevention in combination with CBT elements in a group of BED patients. Moreover, their results indicated that BED patients in the treatment group had significant decreases in eating pathology, depression, and binge eating episodes at follow-up compared to the control group. However, both groups had similar reductions in binge eating episodes at the end of treatment (Schag et al., 2019). Furthermore, a review determined food-related impulsivity interventions for binge eating behaviors such as psychotherapy, direct neuromodulation, computer-assisted training, and pharmacotherapy, all have potential treatment benefits, but did not find any intervention to be more effective than others (İnce et al., 2021). Overall, the previous research supports that the assessment of both impulsivity and eating disorder symptomology will help to better inform and individualize our treatment planning with eating disorder populations. Further development of impulsivity focused treatments could provide benefit for addiction treatment as well. Past research has indicated that pretreatment impulsivity is typically associated with poor treatment outcomes, regardless of the measurement method of impulsivity (Loree, Lundahl, &

Ledgerwood, 2015). Personalized substance use treatment approaches (particularly contingency management strategies) based on pre-treatment impulsivity have shown preliminary evidence in reducing substance use for highly impulsive individuals (Tomko, Bountress, & Gray, 2016). Development of impulsivity-focused treatments could also use this approach presented in this review, especially if considering impulsivity as a transdiagnostic symptom. However, limitations to this approach include its resource intensity, difficulty in matching client/clinician preferences, and limitations of clinician's expertise in providing extensive and personalized treatments (Tomko et al., 2016). Taken together, these findings are promising and suggestive of the potential benefits and need for further testing of impulsivity-focused treatments.

## Appendix A

## College Sample Demographic Survey

1. What is your current gender identity? (Check all that apply)
    a. Male
    b. Female
    c. Female-to-Male (FTM)/Transgender Male
    d. Male-to-Female (MTF)/Transgender Female
    e. Gender Queer, neither exclusively male nor female
    f. Other (please specify) _____
    g. Decline to answer, please explain why _____

2. What sex were you assigned at birth on your original birth certificate? (Check one)
    a. Male
    b. Female
    c. Decline to answer, please explain why _____

3. What is your race? (Select all that apply.)
    a. White
    b. Black or African American
    c. Hispanic or Latino
    d. Native American or American Indian
    e. Asian/ Pacific Island
    f. Middle Eastern
    g. Other
    h. Prefer not to share

4. What is your age?

## Appendix B
## College Sample Disordered Eating Measure

### Eating Disorder Examination Questionnaire (EDE-Q) 6.0

**Instructions:** The following questions are concerned with the past four weeks (28 days) only. Please read each question carefully. Please answer all of the questions. Please only choose one answer for each question. Thank you.

**Questions 1 to 12: Please select the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days) only.**

**On how many of the past 28 days….**

1. Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?

   No days 1-5 days 6-12 days 13-15 days 16-22 days 23-27 days Every day

2. Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?

   No days 1-5 days 6-12 days 13-15 days 16-22 days 23-27 days Every day

3. Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?

   No days 1-5 days 6-12 days 13-15 days 16-22 days 23-27 days Every day

4. Have you tried to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?

   No days 1-5 days 6-12 days 13-15 days 16-22 days 23-27 days Every day

5. Have you had a definite desire to have an empty stomach with the aim of influencing your shape or weight?

   No days 1-5 days 6-12 days 13-15 days 16-22 days 23-27 days Every day

6. Have you had a definite desire to have a totally flat stomach?

   No days 1-5 days 6-12 days 13-15 days 16-22 days 23-27 days Every day

7. Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?

   No days  1-5 days  6-12 days  13-15 days  16-22 days  23-27 days  Every day

8. Has thinking about shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?

   No days  1-5 days  6-12 days  13-15 days  16-22 days  23-27 days  Every day

9. Have you had a definite fear of losing control over eating?

   No days  1-5 days  6-12 days  13-15 days  16-22 days  23-27 days  Every day

10. Have you had a definite fear that you might gain weight?
    No days  1-5 days  6-12 days  13-15 days  16-22 days  23-27 days  Every day

11. Have you felt fat?

    No days  1-5 days  6-12 days  13-15 days  16-22 days  23-27 days  Every day

12. Have you had a strong desire to lose weight?

    No days  1-5 days  6-12 days  13-15 days  16-22 days  23-27 days  Every day

13. Over the past 28 days, how many times have you eaten what other people would regard as an unusually large amount of food (given the circumstances)?
    No days  1-5 days  6-12 days  13-15 days  16-22 days  23-27 days  Every day

14. On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)?

    No days  1-5 days  6-12 days  13-15 days  16-22 days  23-27 days  Every day

15. Over the past 28 days, on how many DAYS have such episodes of overeating occurred (i.e., you have eaten an unusually large amount of food and have had a sense of loss of control at the time)?

    No days  1-5 days  6-12 days  13-15 days  16-22 days  23-27 days  Every day

16. Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight?

    No days  1-5 days  6-12 days  13-15 days  16-22 days  23-27 days  Every day

17. Over the past 28 days, how many times have you taken laxatives as a means of controlling your shape or weight?

No days 1-5 days 6-12 days 13-15 days 16-22 days 23-27 days Every day

18. Over the past 28 days, how many times have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat or to burn off calories?

No days 1-5 days 6-12 days 13-15 days 16-22 days 23-27 days Every day

**Questions 19-21: Please select the appropriate number. Please note that for these questions the term "binge eating" means eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.**

19. Over the past 28 days, on how many days have you eaten in secret (i.e., furtively)?.....Do not count episodes of binge eating

No days 1-5 days 6-12 days 13-15 days 16-22 days 23-27 days Every day

20. On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight?.....Do not count episodes of binge eating

None of the times A few of the times Less than half Half of the times More than half

Most of the time Every time

21. Over the past 28 days, how concerned have you been about other people seeing you eat?.....Do not count episodes of binge eating

Not at all Slightly Moderately Markedly

**Questions 22-28: Please select the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).**

22. Has your weight influenced how you think about (judge) yourself as a person?
Not at all Slightly Moderately Markedly

23. Has your shape influenced how you think about (judge) yourself as a person?
Not at all Slightly Moderately Markedly

24. How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?

Not at all Slightly Moderately Markedly

25. How dissatisfied have you been with your weight?

Not at all Slightly Moderately Markedly

26. How dissatisfied have you been with your shape?

Not at all Slightly Moderately Markedly

27. How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?

Not at all Slightly Moderately Markedly

28. How uncomfortable have you felt about others seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?

Not at all Slightly Moderately Markedly

**Supplemental questions**

29. What is your weight at present? (Please give your best estimate.): _____

30. What is your height? (Please give your best estimate.): _____

31. If female: Over the past three to four months have you missed any menstrual periods?
    a. Yes
    b. No (Skip Q32)
    c. N/A (Skip Q32-33)

32. If so, how many? _____

33. Have you been taking the pill?
    a. Yes
    b. No

## Appendix C

## College Sample General Psychopathology, Suicidal ideation, and Substance Use Measures

### DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure – Adult

**Directions:** During the past **2 weeks**, how much (or how often) have you been bothered by the following problems?

***Depression***

1. Little interest or pleasure in doing things?
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

2. Feeling down, depressed, or hopeless?
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

***Anxiety***

3. Feeling nervous, anxious, frightened, worried, or on edge?
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

4. Feeling panic or being frightened?
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

5. Avoiding situations that make you anxious?
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

***Suicidal ideation***

6. Thoughts that you might be better off dead?
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

7. Thoughts of hurting yourself in some way?
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

**Substance Use**

*In the past 12 months, how often in the past week have you consumed the following substances?*

8. Alcohol
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

9. Smoking any cigarettes, a cigar, or pipe, or using snuff or chewing tobacco?
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

10. Marijuana
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

11. Vapes or E-Cigarettes
    a. None at all
    b. Rare, less than a day or two days
    c. Several days a week
    d. More than half the days of the week
    e. Nearly every day

## Appendix D

## College Sample Impulsivity Measure

**Short UPPS-P Impulsive Behavior Scale (SUPPS-P)**

Below are a number of statements that describe ways in which people act and think. For each statement, please indicate how much you agree or disagree with the statement. Be sure to indicate your agreement or disagreement for every statement below.

1. I generally like to see things through to the end.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

2. My thinking is usually careful and purposeful.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

3. When I am in great mood, I tend to get into situations that could cause me problems.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

4. Unfinished tasks really bother me.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

5. I like to stop and think things over before I do them.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

6. When I feel bad, I will often do things I later regret in order to make myself feel better now.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

7. Once I get going on something I hate to stop.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

8. Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

9. I quite enjoy taking risks.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

10. I tend to lose control when I am in a great mood.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

11. I finish what I start.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

12. I tend to value and follow a rational, "sensible" approach to things.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

13. When I am upset I often act without thinking.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

14. I welcome new and exciting experiences and sensations, even if they are a little

frightening and unconventional.

a. Agree Strongly
b. Agree Some
c. Disagree Some
d. Disagree Strongly

15. When I feel rejected, I will often say things that I later regret.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

16. I would like to learn to fly an airplane.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

17. Others are shocked or worried about the things I do when I am feeling very excited.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

18. I would enjoy the sensation of skiing very fast down a high mountain slope.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

19. I usually think carefully before doing anything.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

20. I tend to act without thinking when I am really excited.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

## Appendix E

## College Sample CSBD Measure

**Compulsive Sexual Behavior Inventory (CSBI)-13 ©**

Circle the answer that most accurately describes your response. Never Rarely Occasionally Frequently Very Frequently

1. How often have you had trouble controlling your sexual urges? 1 2 3 4 5

2. Have you felt unable to control your sexual behavior? 1 2 3 4 5

3. How often have you used sex to deal with worries or problems in your life? 1 2 3 4

4. How often have you felt guilty or shameful about aspects of your sexual behavior? 1 2 3 4 5

5. How often have you concealed or hidden your sexual behavior from others? 1 2 3 4 5

6. How often have you been unable to control your sexual feelings? 1 2 3 4 5

7. How often have you made pledges or promises to change or alter your sexual behavior? 1 2 3 4 5

8. How often have your sexual thoughts or behaviors interfered with the formation of friendships? 1 2 3 4 5

9. How often have you developed excuses and reasons to justify your sexual behavior? 1 2 3 4 5

10. How often have you missed opportunities for productive and enhancing activities because of your sexual activity? 1 2 3 4 5

11. How often have your sexual activities caused financial problems for you? 1 2 3 4 5

12. How often have you felt emotionally distant when you were engaging in sex with others?1 2 3 4 5

13. How often have you had sex or masturbated more than you wanted to? 1 2 3 4 5

## Appendix F

## Community Sample Demographic Survey

1. What sex were you assigned at birth (on your original birth certificate)?
    a. Male
    b. Female
2. What gender or gender identity do you identify with?
    a. Masculine/Man
    b. Feminine/Woman
    c. Indigenous or other cultural gender minority
    d. Non-binary, gender fluid, or something else (e.g., gender queer)
    e. Other (if you wish, tell us how personally describe your gender)_____
3. How old are you? (years) Please write numbers only.
4. What is your highest level of education?
    a. Primary (e.g., elementary school)
    b. Secondary (e.g., high school)
    c. Tertiary (e.g., college or university)
5. Do you belong to any ethnic minority groups in your country (current place of residence)?
    a. No
    b. Yes, please specify: _____
6. What is your relationship status?
    a. Single
    b. In a relationship
    c. Married or common-law partners
    d. Widow or widower
    e. Divorced
7. In your opinion, how good are your life circumstances compared to others?
    a. My life circumstances are among the worst
    b. My life circumstances are much worse than average
    c. My life circumstances are worse than average

d. My life circumstances are average

e. My life circumstances are better than average

f. My life circumstances are much better than average

g. My life circumstances are among the best

## Appendix G

## Community Sample Disordered Eating Measure

### Binge Eating Disorder Screener-7 (BEDS-7)

The following questions ask about your eating patterns and behaviors within the last 3 months. For each question, choose the answer that best applies to you

1. During the last 3 months, did you have any episodes of excessive overeating (i.e., eating significantly more than what most people would eat in a similar period of time)?
    a. Yes
    b. No

2. Do you feel distressed about your episodes of excessive overeating?
    a. Yes
    b. No

| | Within the past 3 months… | Never or Rarely | Sometimes | Often | Always |
|---|---|---|---|---|---|
| 3. | During your episodes of excessive overeating, how often did you feel like you had no control over your eating (e.g., not being able to stop eating, feel compelled to eat, or going back and forth for more food)? | O | O | O | O |
| 4. | During your episodes of excessive overeating, how often did you continue eating even though you were not hungry? | O | O | O | O |
| 5. | During your episodes of excessive overeating, how often were you embarrassed by how much you ate? | O | O | O | O |
| 6. | During your episodes of excessive overeating, how often did you feel disgusted with yourself or guilty afterward? | O | O | O | O |
| 7. | During the last 3 months, how often did you make yourself vomit as a means to control your weight or shape? | O | O | O | O |

## Appendix H

## Community Sample General Psychopathology Measures

### Brief Symptom Inventory 12 (BSI-12)

**How distressing have the following items been over the past week?**

1. Feeling no interest in things
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

2. Feeling lonely
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

3. Feeling hopeless about the future
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

4. Feeling blue
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

5. Feelings of worthlessness
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

6. Thoughts of ending your life
    a. Not at all
    b. A little bit

c. Moderately
d. Quite a bit
e. Extremely

7. Nervousness or shakiness inside
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

8. Feeling tense or keyed up
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

9. Suddenly scared for no reason
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

10. Spells of terror or panic
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

11. Feeling so restless you could not sit still
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

12. Feeling fearful
    a. Not at all
    b. A little bit
    c. Moderately
    d. Quite a bit
    e. Extremely

## P4 Suicidality Screener

Screener question: Have you had thoughts of actually hurting yourself? (Yes or No)

1. Have you ever attempted to harm yourself in the past?
    a. Yes
    b. No

2. Have you thought about how you might actually hurt yourself?
    a. Yes (How?_____)
    b. No

3. There's a big difference between having a thought and acting on a thought. How likely do you think it is that you will act on these thoughts about hurting yourself or ending your life some time over the next month?"
    a. Not at all likely
    b. Somewhat likely
    c. Very likely

4. Is there anything that would prevent or keep you from harming yourself?
    a. Yes (What?_____)
    b. No

## Appendix I

## Community Sample Impulsivity Measure

**Short UPPS-P Impulsive Behavior Scale (SUPPS-P)**

Below are a number of statements that describe ways in which people act and think. For each statement, please indicate how much you agree or disagree with the statement. Be sure to indicate your agreement or disagreement for every statement below.

1. I generally like to see things through to the end.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

2. My thinking is usually careful and purposeful.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

3. When I am in great mood, I tend to get into situations that could cause me problems.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

4. Unfinished tasks really bother me.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

5. I like to stop and think things over before I do them.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

6. When I feel bad, I will often do things I later regret in order to make myself feel better now.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

7. Once I get going on something I hate to stop.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

8. Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

9. I quite enjoy taking risks.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

10. I tend to lose control when I am in a great mood.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

11. I finish what I start.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

12. I tend to value and follow a rational, "sensible" approach to things.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

13. When I am upset I often act without thinking.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

14. I welcome new and exciting experiences and sensations, even if they are a little

frightening and unconventional.

a. Agree Strongly
b. Agree Some
c. Disagree Some
d. Disagree Strongly

15. When I feel rejected, I will often say things that I later regret.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

16. I would like to learn to fly an airplane.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

17. Others are shocked or worried about the things I do when I am feeling very excited.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

18. I would enjoy the sensation of skiing very fast down a high mountain slope.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

19. I usually think carefully before doing anything.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

20. I tend to act without thinking when I am really excited.
    a. Agree Strongly
    b. Agree Some
    c. Disagree Some
    d. Disagree Strongly

## Appendix J

## Community Sample CSBD Measure

### Compulsive Sexual Behavior Disorder Scale (CSBD-19)

Below are a number of statements that describe various thoughts, feelings, and behaviors about sex. Please, think back to the **past six months** and indicate on the following 4-point scale to what extent the statements apply to you. There are no right or wrong answers.

*For the purpose of this questionnaire, sex is defined as any activity or behavior that stimulates or arouses a person with the intent to produce an orgasm or sexual pleasure (e.g., self-masturbation or solosex, using pornography, intercourse with a partner, oral sex, anal sex, etc.). Sexual behaviors may or may not involve a partner.*

*1 – totally disagree* *2 – somewhat disagree* *3 – somewhat agree* *4 – totally agree*

| | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1. | Even though my sexual behavior was irresponsible or reckless, I found it difficult to stop. | O | O | O | O |
| 2. | Sex has been the most important thing in my life. | O | O | O | O |
| 3. | I was able to resist my sexual urges for only a little while before I surrendered to them. | O | O | O | O |
| 4. | I had sex even when I did not enjoy it anymore. | O | O | O | O |
| 5. | My sexual urges and impulses changed me in a negative way. | O | O | O | O |
| 6. | I could not control my sexual cravings and desires. | O | O | O | O |
| 7. | I would rather have had sex than to have done anything else. | O | O | O | O |
| 8. | Trying to reduce the amount of sex I had almost never worked. | O | O | O | O |
| 9. | Although sex was not as satisfying for me as before, I engaged in it. | O | O | O | O |
| 10. | I did not accomplish important tasks because of my sexual behavior. | O | O | O | O |
| 11. | My sexual desires controlled me. | O | O | O | O |
| 12. | When I could have sex, everything else became irrelevant. | O | O | O | O |
| 13. | I was not successful in reducing the amount of sex I had. | O | O | O | O |
| 14. | Although my sex life was not as satisfying as it had been before, I had sex. | O | O | O | O |
| 15. | My sexual activities interfered with my work and/or education. | O | O | O | O |
| 16. | My sexual behaviors had negative impact on my relationships with others. | O | O | O | O |
| 17. | I have been upset because of my sexual behaviors. | O | O | O | O |
| 18. | My sexual activities interfered with my ability to experience healthy sex. | O | O | O | O |
| 19. | I often found myself in an embarrassing situation because of my sexual behavior. | O | O | O | O |

## Appendix K

## Comparison of Measures Across Samples

Community Sample Measures (ISS)

- **Impulsivity (Short UPPS-P Impulsivity Scale, SUPPS-P)**
- **Binge Eating (Binge Eating Disorder Screener-7, BEDS-7)**
- **Psychopathology Composite: Depression and anxiety (Brief Symptom Inventory, BSI-12) and P4 Suicidality Screener**
- **The Compulsive Sexual Behavior Disorder Scale (CSBD-19)**
- **Sociodemographics and BMI**

College Sample Measures (SHS)

- **Impulsivity (Short UPPS-P Impulsivity Scale, SUPPS-P)**
- **Disordered Eating (The Eating Disorder Examination Questionnaire 6.0, EDE-Q)**
- **Psychopathology Composite: Depression, anxiety, and suicidal ideation (DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure – Adult)**
- **The Compulsive Sexual Behavior Inventory-13 (CSBI-13)**
- **Sociodemographics and BMI**
- Substance Use (DSM-5 Level 2-Substance Use-Adult)

*Note*: Measures assessing similar domains have the same color

## Appendix L

## Tables

**Table 1. Descriptive Statistics for Sociodemographic Variables of College Sample (N=2,161)**

| Variables of Interest | Mean or majority %[a] | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| Age | 19.95 | 4.00 | 4.75 | 27.81 |
| Sex | 69.5% Female | .46 | -.82 | -1.20 |
| Sexual Orientation | 82.6% Heterosexual | .37 | 1.77 | 1.13 |
| BMI | 25.06 | 5.87 | 1.51 | 3.19 |
| Race/Ethnicity | 31.8% White | | | |

*Note*: BMI=Body Mass Index, the descriptive statistics reflect all available data for the variable(s)

**Table 2. Descriptive Statistics for Sociodemographic Variables of Community Sample (N=1,898)**

| Variables of Interest | Mean or majority %[a] | SD | Skewness | Kurtosis |
|---|---|---|---|---|
| Age | 33.73 | 14.98 | 1.02 | 0.20 |
| Sex | 52.1% Female | 0.50 | -0.08 | -2.00 |
| Sexual Orientation | 48.8% Heterosexual | 2.67 | 0.93 | -0.31 |
| BMI | 27.90 | 6.92 | 0.78 | 0.12 |
| Minority Status | 75.2% belonged to majority group | 0.43 | 1.17 | -0.62 |
| Relationship Status | 35.7% Single | 1.02 | 0.70 | 0.24 |
| Educational Status | 79.1% At least some college or higher | 0.42 | -1.54 | 0.76 |
| Perceived Socioeconomic Status | 36.1% Believed their life circumstances were better than average | 1.13 | -.39 | 0.14 |

*Note*: BMI=Body Mass Index, the descriptive statistics reflect all available data for the variable(s)

**Table 3. Bivariate Pearson Correlations for College Sample Variables**

| Variable | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. CSBI-13 | 22.85 | 8.42 | _ | .20** | .35** | .09** | .14** | .09** | .29** | .28** | .30** | .27** | .04 | .30** | .02 | .33** |
| 2. EDEQ | 1.82 | 1.46 | .20** | _ | .26** | .06** | .11** | -.04 | .10** | .38** | .34** | .24** | .00 | .15** | .35** | .41** |
| 3. SUPPS-P Negative Urgency | 9.26 | 2.93 | .35** | .26** | _ | .02 | .25** | .12** | .61** | .32** | .30** | .22** | -.07** | .18** | .03 | .35** |
| 4. SUPPS-P (Lack of) Perseverance | 6.87 | 2.04 | .09** | .06** | .02 | _ | .47** | -.18** | .02 | .14** | .14** | .16** | -.07** | .13** | -.02 | .16** |
| 5. SUPPS-P (Lack of Premeditation) | 6.93 | 2.11 | .14** | .11** | .25** | .47** | _ | .00 | .28** | .13** | .17** | .16** | -.04 | .16** | .02 | .17** |
| 6. SUPPS-P Sensation Seeking | 10.54 | 2.75 | .09** | -.04 | -.12** | -.18** | .00 | _ | .30** | -.11** | -.05 | -.05 | -.04 | .10** | -.04 | -.10** |
| 7. SUPPS-P Positive Urgency | 7.87 | 2.80 | .29** | .10** | .61** | .03 | .28** | .30** | _ | .14** | .15** | .18** | -.11** | .16** | .01 | .17** |
| 8. DSM-5 Cross-cutting Anxiety | 1.28 | 1.06 | .28** | .38** | .32** | .14** | .13** | -.11** | .14** | _ | .65** | .42** | -.06* | .17** | .02 | .93** |
| 9. DSM-5 Cross-cutting Depression | 1.31 | 1.08 | .30** | .34** | .30** | .14** | .17** | -.05 | .15** | .65** | _ | .47** | -.03 | .20** | .03 | .87** |
| 10. DSM-5 Cross-cutting Suicidal Ideation | .36 | .80 | .27** | .24** | .22** | .16** | .16** | -.05 | .18** | .42** | .47** | _ | -.04 | .23** | .04 | .60** |
| 11. Age | 19.95 | 4.00 | .04 | .00 | -.07** | -.07** | -.04 | -.04 | -.11** | -.06* | -.03 | -.04 | _ | .11** | .19** | -.05* |
| 12. Substance use frequency | 2.11 | 3.04 | .29** | .15** | .18** | .13** | .16** | .10** | .16** | .17** | .20** | .23** | .11** | _ | .02 | .22** |
| 13. BMI | 25.06 | 5.87 | .02 | .35** | .03 | -.02 | .02 | -.04 | .01 | .02 | .03 | .04 | .19** | .02 | _ | .03 |
| 14. Psychopathology Composite | | | .33** | .41** | .35** | .16** | .17** | -.10** | .17** | .93** | .87** | .60** | -.05* | .22** | .03 | _ |

**Correlation is significant at the 0.01 level (2-tailed). CSBI-13=The Compulsive Sexual Behavior Index 13, EDEQ=Eating Disorder Examination Questionnaire 6.0, SUPPS-P= The Short UPPS-P Impulsive Behavior Scale, DSM-5=The Diagnostic and Statistical Manual of Mental Disorders 5th edition, BMI= body mass index

**Table 4. Bivariate Pearson Correlations for Impulsivity and Other Variables in the College Sample**

| Variable | *M* | *SD* | Negative urgency | Lack of Perseverance | Lack of Premeditation | Sensation Seeking | Positive urgency |
|---|---|---|---|---|---|---|---|
| 1. CSBI-13 | 22.85 | 8.42 | .35** | .09** | .14** | .09** | .29** |
| 2. EDEQ | 1.82 | 1.46 | .26** | .06** | .11** | -.04 | .10** |
| 3. DSM-5 Cross-cutting Anxiety | 1.28 | 1.06 | .32** | .14** | .13** | -.11** | .14** |
| 4. DSM-5 Cross Cutting Depression | 1.31 | 1.08 | .30** | .14** | . .17** | -.05 | .15** |
| 5. DSM-5 Cross-cutting Suicidal Ideation | .36 | .80 | .22** | .16** | .16** | -.05 | .18** |
| 6. Age | 19.95 | 4.00 | -.07** | -.07** | -.04 | -.04 | -.11** |
| 7. Substance use frequency | 2.11 | 3.04 | .18** | .13** | .16** | .10** | .16** |
| 8. BMI | 25.06 | 5.87 | .03 | -.02 | .02 | -.04 | .01 |
| 9. Psychopathology Composite | | | .35** | .16** | .17** | -.10** | .17** |

**Correlation is significant at the 0.01 level (2-tailed). CSBI-13=The Compulsive Sexual Behavior Index 13, EDEQ=Eating Disorder Examination Questionnaire 6.0, SUPPS-P= The Short UPPS-P Impulsive Behavior Scale, DSM-5=The Diagnostic and Statistical Manual of Mental Disorders 5th edition, BMI= body mass index

**Table 5. MANOVA Results and Means for Sociodemographic Characteristics on SUPPS-P Negative and Positive Urgency in the College Sample**

| | **Negative Urgency** | | **Positive Urgency** | | | | | |
|---|---|---|---|---|---|---|---|---|
| ***Sociodemographic Characteristics*** | Mean | SD | Mean | SD | *df* | *F* | *p* | Partial Eta Squared ($\eta_p^2$) |
| **Sex** | | | | | 2 | 32.97 | **<.001** | 0.03 |
| Male | 9.16 | 2.91 | 8.40 | 2.83 | | | | |
| Female | 9.32 | 2.95 | 7.66 | 2.76 | | | | |
| **Sexual Orientation** | | | | | 2 | 7.65 | **<.001** | 0.007 |
| Heterosexual/Straight | 9.16 | 2.94 | 7.82 | 2.85 | | | | |
| Sexual Minority | 9.81 | 2.86 | 8.24 | 2.80 | | | | |
| **Race** | | | | | 2 | 3.64 | .026 | 0.003 |
| White | 9.29 | 2.97 | 7.71 | 2.75 | | | | |
| Non-White | 9.26 | 2.92 | 7.98 | 2.81 | | | | |
| **BMI category** | | | | | 4 | 1.85 | .086 | 0.003 |
| Obese | 9.44 | 3.09 | 7.74 | 2.86 | | | | |
| Overweight | 9.24 | 2.95 | 7.93 | 2.90 | | | | |
| Healthy Weight | 9.17 | 2.89 | 7.90 | 2.74 | | | | |
| Underweight | 9.34 | 2.87 | 7.54 | 2.54 | | | | |

*Note:* MANOVA=multivariate analysis of variance; SD=standard deviation; *df*=degrees of freedom; SUPPS-P=short UPPS-P Impulsive Behavior Scale

**Table 6. Chi-square Results for Sociodemographic Characteristics and EDE-Q classification in the College Sample**

| | **Non-clinical** | | **Clinical** | | **Total** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Sociodemographic Characteristics*** | n | % | n | % | n | % | $\chi^2$ | *p* | Cramer's V |
| **Sex** | | | | | | | 109.06 | **<.001** | 0.23 |
| Male | 441 | 25.3% | 213 | 51.6% | 654 | 30.3% | | | |
| Female | 1,302 | 74.7% | 200 | 48.4% | 1,502 | 69.7% | | | |
| **Sexual Orientation** | | | | | | | 17.50 | **<.001** | 0.90 |
| Heterosexual/Straight | 1,473 | 84.8% | 313 | 76.2% | 1,786 | 83.1% | | | |
| Sexual Minority | 265 | 15.2% | 98 | 23.8% | 363 | 16.9% | | | |
| **Race** | | | | | | | 0.02 | .89 | 0.03 |
| White | 555 | 31.8% | 133 | 32.1% | 688 | 31.9% | | | |
| Non-White | 1,191 | 68.2% | 281 | 67.9% | 1,472 | 68.1% | | | |
| **BMI category** | | | | | | | 105.40 | **<.001** | 0.23 |
| Obese | 207 | 12.7% | 118 | 30.5% | 325 | 16.1% | | | |
| Overweight | 366 | 22.4% | 117 | 30.2% | 483 | 23.9% | | | |
| Healthy Weight | 960 | 58.8% | 143 | 37% | 1103 | 54.6% | | | |
| Underweight | 100 | 6.1% | 9 | 2.3% | 109 | 5.4% | | | |

*Note:* $\chi^2$=chi-square, EDE-Q = Eating Disorder Examination Questionnaire

**Table 7. Bivariate Pearson Correlations for Community Sample Variables**

| Variable | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. CSBD-19 | 30.13 | 10.00 | — | .17** | .26** | .14** | .20** | .13** | .31** | .20** | .27** | .16** | .03 | .06** | .26** |
| 2. BEDS-7 | 2.28 | 4.16 | .17** | — | .21** | .15** | .15** | -.01 | .21** | .27** | .32** | .19** | -.15** | .24** | .33** |
| 3. SUPPS-P Negative Urgency | 8.82 | 3.02 | .26** | .21** | — | .23** | .42** | .07** | .59** | .31** | .31** | .21** | -.20** | .01 | .35** |
| 4. SUPPS-P (Lack of) Perseverance | 7.89 | 2.69 | .13** | .15** | .23** | — | .47** | -.04 | .28** | .25** | .31** | .22** | -.21** | -.03 | .32** |
| 5. SUPPS-P (Lack of Premeditation) | 6.87 | 2.30 | .20** | .15** | .42** | .47** | — | .12** | .47** | .19** | .24** | .20** | -.13** | .01 | .25** |
| 6. SUPPS-P Sensation Seeking | 10.44 | 2.71 | .13** | -.01 | .07** | -.04 | .12** | — | .27** | .00 | .00 | .06 | -.11** | -.04 | .00 |
| 7. SUPPS-P Positive Urgency | 9.49 | 2.63 | .31** | .21** | .59** | .28** | .47** | .27** | — | .30** | .27** | .23** | -.24** | .03 | .33** |
| 8. BSI-18 Anxiety | 6.38 | 5.84 | .20** | .27** | .31** | .25** | .19** | .00 | .30** | — | .65** | .39** | -.33** | -.07** | .89** |
| 9. BSI-18 Depression | 7.03 | 6.30 | .27** | .32** | .31** | .31** | .24** | .00 | .27** | .65** | — | .47** | -.27** | -.01 | .92** |
| 10. P4 Total Score | .62 | 1.04 | .16** | .19** | .21** | .22** | .20** | .06 | .23** | .39** | .47** | — | -.23** | .04 | .55** |
| 11. Age | 33.73 | 14.98 | .03 | -.15** | -.20** | -.21** | -.13** | -.11** | -.24** | -.33** | -.27** | -.23** | — | .24** | -.34** |
| 12. BMI | 27.90 | 6.92 | .06** | .24** | .01 | -.03 | .01 | -.04 | .03 | -.07** | -.01 | .04 | .24** | — | -.04 |
| 13. Psychopathology Composite | 14.06 | 11.59 | .26** | .33** | .35** | .32** | .25** | .00 | .33** | .89** | .92** | .55** | -.34** | -.04 | — |

**Correlation is significant at the 0.01 level (2-tailed). CSBD-19=The Compulsive Sexual Behavior Disorder Scale 19, BEDS-7=Binge Eating Disorder Screener-7, SUPPS-P=The Short UPPS-P Impulsive Behavior Scale, BSI-18=Brief Symptom Inventory 18, P4=P4 Suicidality Screener, BMI= body mass index

**Table 8. Bivariate Pearson Correlations for Impulsivity and Other Variables in the Community Sample**

| Variable | *M* | *SD* | Negative urgency | Lack of Perseverance | Lack of Premeditation | Sensation Seeking | Positive urgency |
|---|---|---|---|---|---|---|---|
| 1. CSBD-19 | 30.13 | 10.00 | .26** | .14** | .20** | .13** | .31** |
| 2. BEDS-7 | 2.28 | 4.16 | .21** | .15** | .15** | -.01 | .21** |
| 3. BSI-18 Anxiety | 6.38 | 5.84 | .31** | .25** | .00 | .00 | .30** |
| 4. BSI-18 Depression | 7.03 | 6.30 | .31** | .31** | .00 | .00 | .27** |
| 5. P4 | 0.62 | 1.04 | .21** | .22** | .06* | .06* | .23** |
| 6. Age | 33.73 | 14.98 | -.20** | -.21** | -.11** | -.11** | -.24** |
| 7. BMI | 27.90 | 6.92 | .01 | -.03 | -.04 | -.04 | .03 |
| 8. Psychopathology Composite | 14.06 | 11.59 | .35** | .32** | .00 | .00 | .33** |

**Correlation is significant at the 0.01 level (2-tailed). CSBD-19=The Compulsive Sexual Behavior Disorder Scale 19, BEDS-7= Binge Eating Disorder Screener-7, SUPPS-P= The Short UPPS-P Impulsive Behavior Scale, BSI-18= Brief Symptom Inventory 18, P4= P4 Suicidality Screener, BMI= body mass index

**Table 9. MANOVA Results and Means for Sociodemographic Characteristics on SUPPS-P Negative and Positive Urgency in the Community Sample**

| | Negative Urgency | | Positive Urgency | | | | | |
|---|---|---|---|---|---|---|---|---|
| ***Sociodemographic Characteristics*** | Mean | SD | Mean | SD | *df* | *F* | *p* | Partial Eta Squared ($\eta_p^2$) |
| **Sex** | | | | | 2 | 12.0 | **<.001** | 0.01 |
| Male | 8.49 | 2.97 | 9.24 | 2.65 | | | | |
| Female | 9.13 | 3.03 | 9.72 | 2.61 | | | | |
| **Sexual Orientation** | | | | | 2 | 11.18 | **<.001** | 0.01 |
| Heterosexual/Straight | 8.69 | 2.96 | 9.20 | 2.52 | | | | |
| Sexual Minority | 8.95 | 3.08 | 9.76 | 2.71 | | | | |
| **Race** | | | | | 2 | 1.92 | .147 | 0.002 |
| Ethnic Majority | 8.78 | 3.03 | 9.42 | 2.58 | | | | |
| Ethnic Minority | 8.98 | 3.01 | 9.70 | 2.77 | | | | |
| **BMI category** | | | | | 4 | 0.85 | .534 | 0.001 |
| Obese | 8.85 | 3.07 | 9.79 | 1.93 | | | | |
| Overweight | 8.71 | 3.03 | 9.45 | 2.58 | | | | |
| Healthy Weight | 8.82 | 3.03 | 9.45 | 2.69 | | | | |
| Underweight | 9.58 | 2.94 | 9.51 | 2.77 | | | | |

*Note:* MANOVA=multivariate analysis of variance; SD=standard deviation; *df*=degrees of freedom; SUPPS-P=short UPPS-P Impulsive Behavior Scale

**Table 10. Sample Comparisons on Demographics and SUPPS-P subscales**

| Variables of Interest | College Sample[a] % or *M*(SD) | Community Sample[b] % or *M*(SD) | T value[c] |
|---|---|---|---|
| **Demographic Variables** | | | |
| Age | 19.95 (4.00) | 33.73 (14.98) | **-38.87**** |
| Sex | 69.5% Female | 52.1% Female | |
| Sexual Orientation | 82.6% Heterosexual | 48.8% Heterosexual | |
| BMI | 25.06 (5.87) | 27.90 (6.92) | **-13.60**** |
| Minority Status | 68.2% | 24.8% | |
| | | | |
| **SUPPS-P Subscales** | | | |
| Positive Urgency | 7.87 (2.80) | 9.49 (2.63) | **-18.98**** |
| Negative Urgency | 9.26 (2.93) | 8.82 (3.02) | **4.37**** |
| Sensation Seeking | 10.54 (2.75) | 10.44 (2.71) | 1.28 |
| (Lack of) Premeditation | 6.93 (2.11) | 6.87 (2.30) | 0.86 |
| (Lack of) Perseverance | 6.87 (2.04) | 7.89 (2.69) | **-13.45**** |

*Note*. **p*<0.05, ***p*< 0.01; significant group comparisons bolded, SUPPS-P=Short UPPS-P Impulsive Behavior Scale

[a]The college sample had an overall sample size of 2,161

[b]The community sample had an overall sample size of 1,898

[c]Comparisons reflect all available data from variables that were included in both samples; T-tests were used for continuous variable comparisons

## Appendix M

## Figures

**Figure 1.**

**Mediation Model for College Sample Exploring Disordered Eating, Psychopathology, and Negative Urgency as the Mediator (Aim One)**

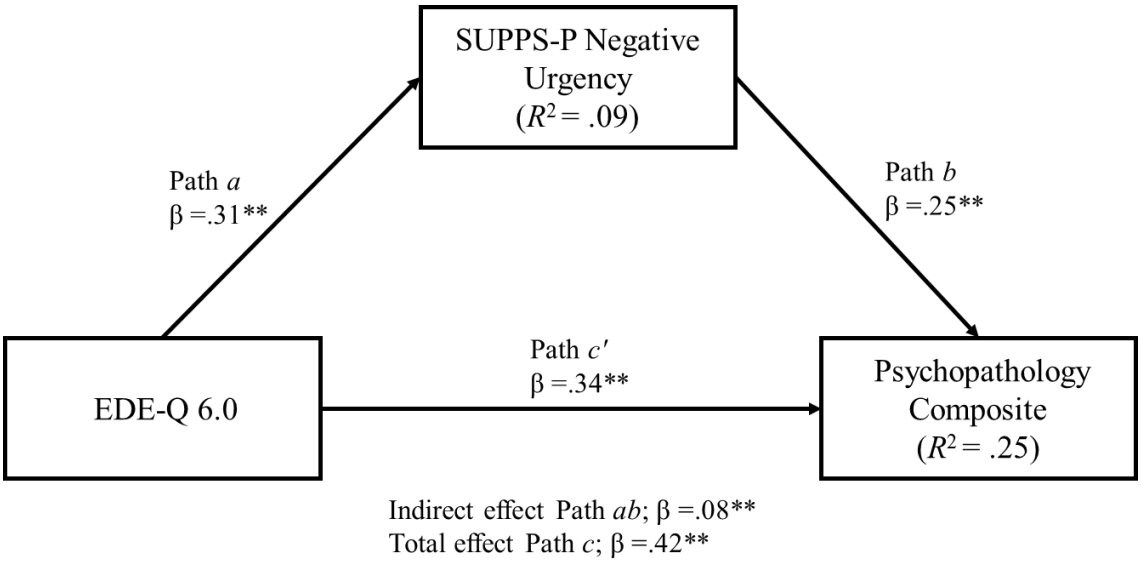

**Figure 2.**

**Mediation Model for College Sample Exploring Disordered Eating, Psychopathology, and Positive Urgency as the Mediator (Aim One)**

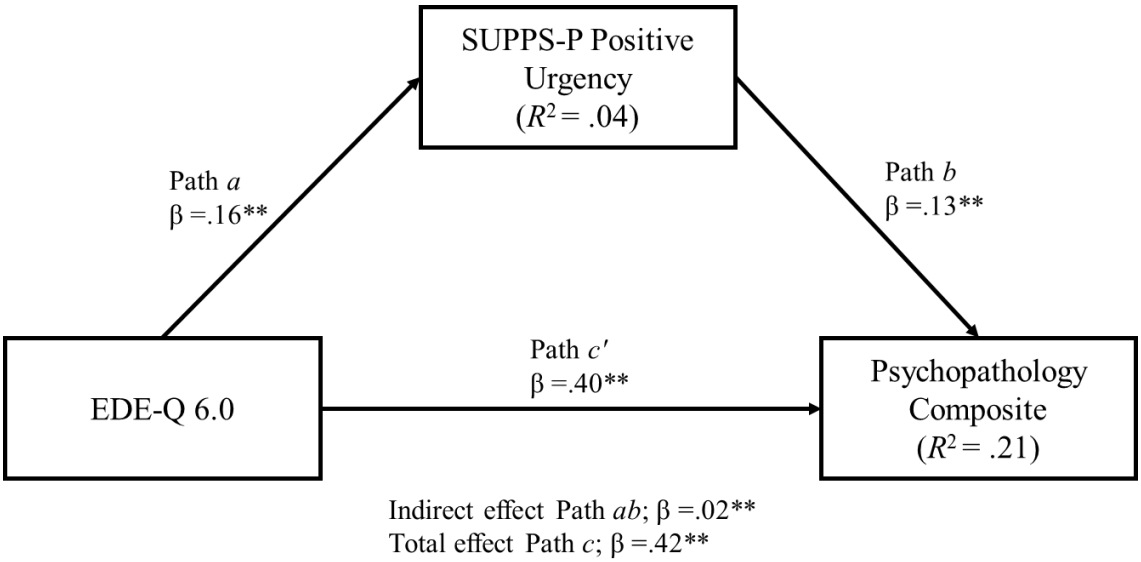

**Figure 3.**

**Mediation Model for College Sample Exploring Disordered Eating, Compulsive Sexual Behavior, and Negative Urgency as the Mediator (Aim Two)**

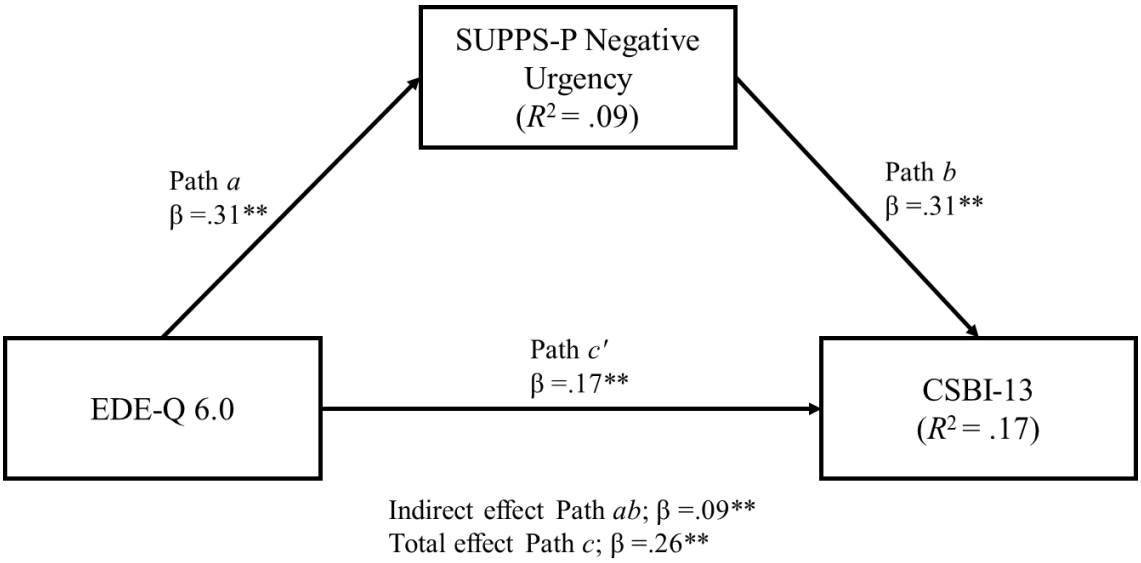

**Figure 4.**

**Mediation Model for College Sample Exploring Disordered Eating, Compulsive Sexual Behavior, and Positive Urgency as the Mediator (Aim Two)**

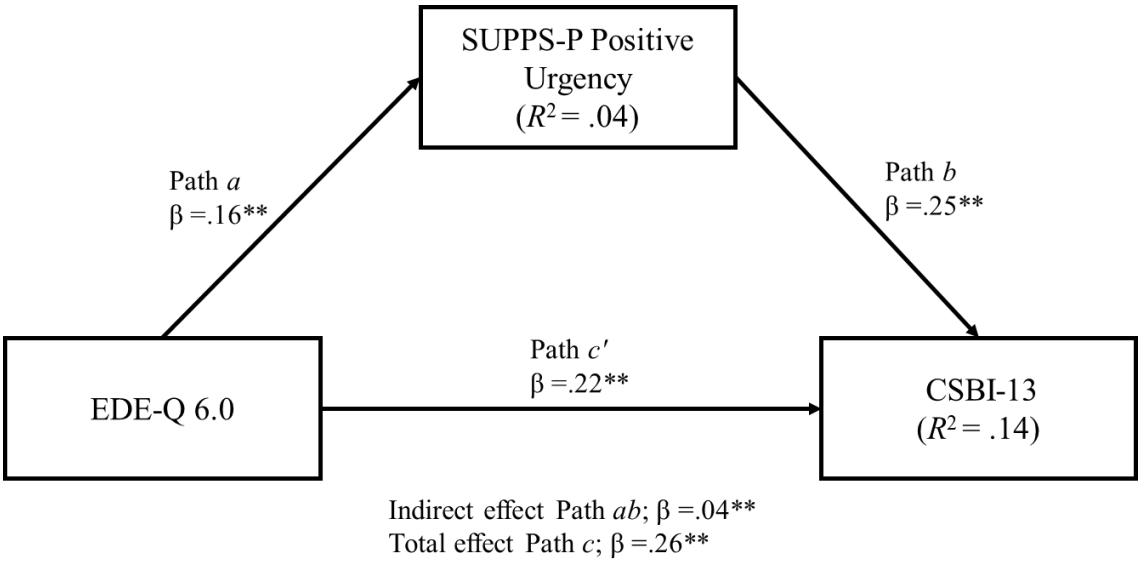

**Figure 5.**

**Mediation Model for Community Sample Exploring Binge Eating Symptoms, Psychopathology, and Negative Urgency as the Mediator (Aim One)**

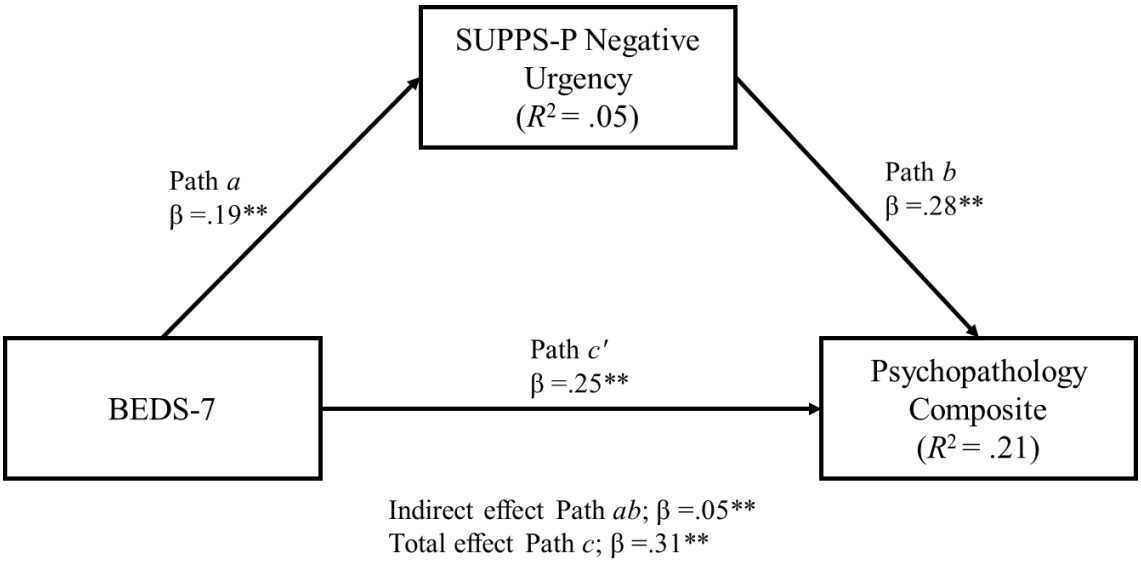

**Figure 6.**

**Mediation Model for Community Sample Exploring Binge Eating Symptoms, Psychopathology, and Positive Urgency as the Mediator (Aim One)**

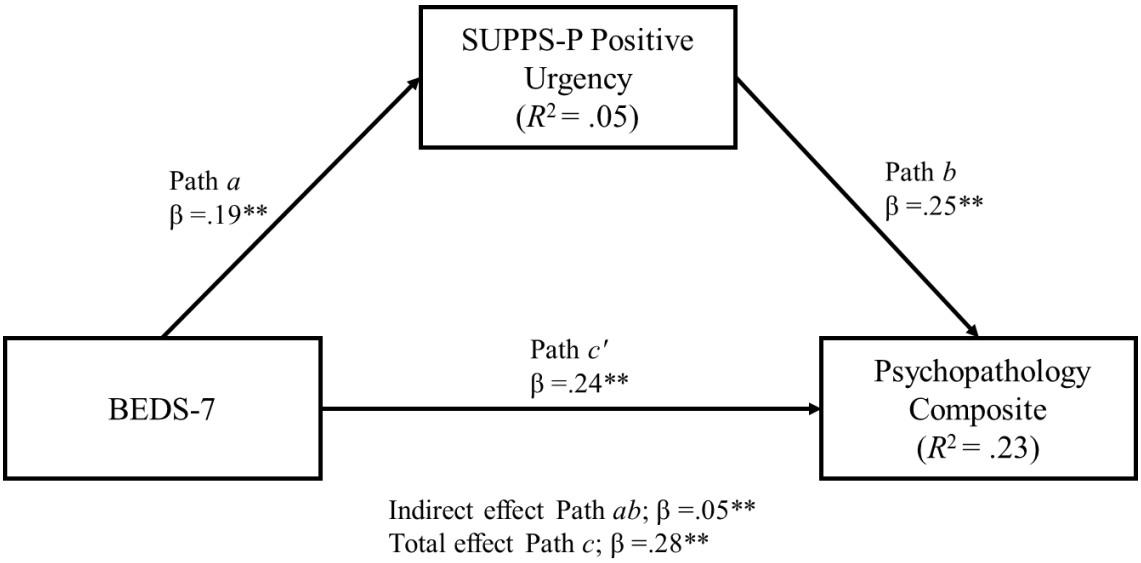

**Figure 7.**

**Mediation Model for Community Sample Exploring Binge Eating Symptoms, Compulsive Sexual Behavior, and Negative Urgency as the Mediator (Aim Two)**

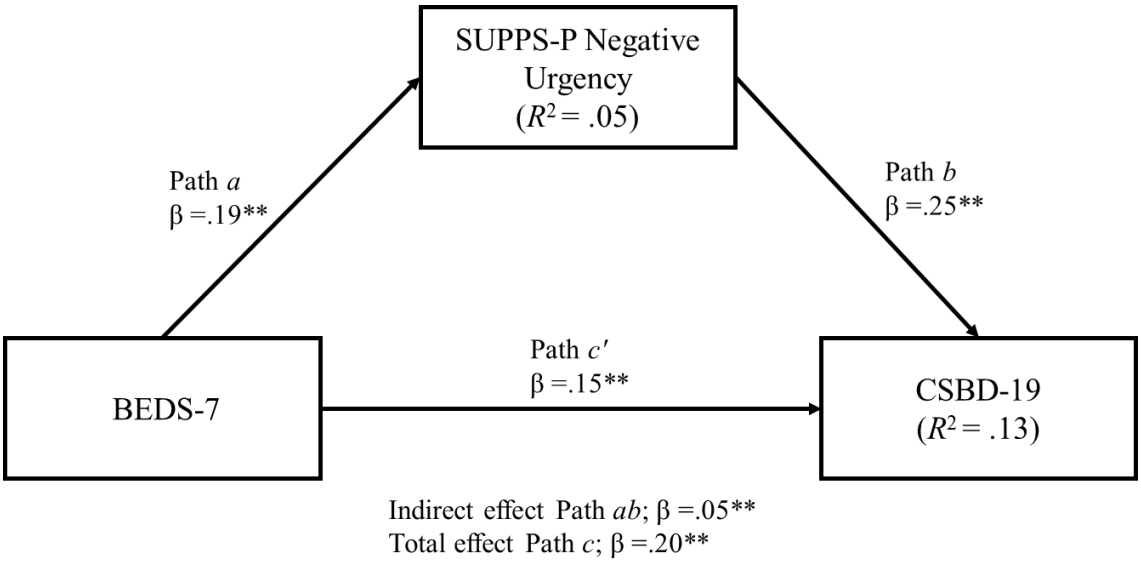

**Figure 8.**

**Mediation Model for Community Sample Exploring Binge Eating Symptoms, Compulsive Sexual Behavior, and Positive Urgency as the Mediator (Aim Two)**

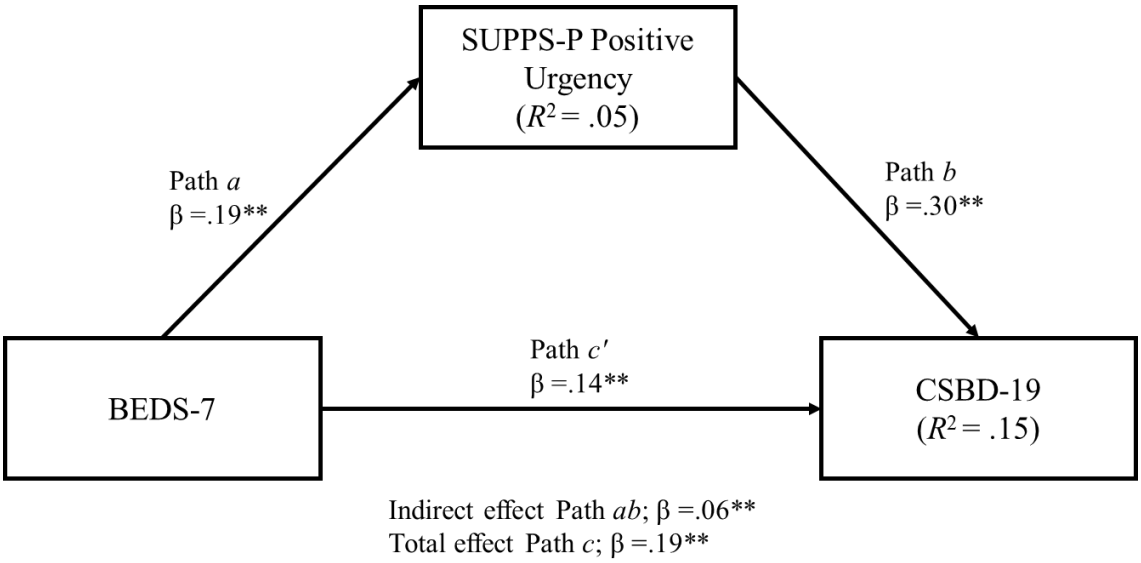

**Figure 9.**

**Summary of Relationships between Psychiatric Concerns and Trait Impulsivity**

| | Substance use disorders | Gambling disorder | Compulsive Sexuality | Anxiety disorders | Borderline Personality traits | Depression | Disordered eating |
|---|---|---|---|---|---|---|---|
| Positive urgency | + | X | X | X | X | + | + |
| Negative urgency | + | + | + | + | + | + | + |
| (Lack of) Perseverance | + | + | - | + | + | + | + |
| (Lack of) Premeditation | + | X | - | X | + | + | X |
| Sensation seeking | + | X | + | X | X | X | X |

*Note:* + =Positive Relationship between variables; - =Negative Relationship between variables; X=Inconsistent or mixed findings for the relationship between variables

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## EDUCATION

**Predoctoral Clinical Internship (APA Accredited, in): July 2023-July 2024**
**West Virginia University School of Medicine (Morgantown, West Virginia)**
Behavioral Medicine Track

**Ph.D. Clinical Psychology (APA Accredited, in progress): August 2019- May 2024**
**University of Nevada, Las Vegas: August 2019- May 2024**
Major: Psychology
Overall GPA: 3.88
Advisor: Dr. Shane Kraus
Dissertation: Relationships between Psychopathology, Impulsivity and Disordered Eating

**M.S. Experimental Psychology: August 2017-May 2019**
**The College of William & Mary: August 2017-May 2019**
Major: Psychology
Overall GPA: 3.9
Advisor: Dr. Catherine Forestell
Thesis: Role of Food Neophobia and Early Exposure in Children's Implicit Attentional Bias to Fruits and Vegetables

**B.A. Psychology: August 2012-May 2016**
**University of Texas at Austin: August 2013- May 2016**
Major: Psychology
Minor: Education
Overall GPA: 3.66
Psych GPA: 3.9

**University of Texas at Arlington: August 2012- May 2013**
Major: Undeclared
Overall GPA: 3.87

## RESEARCH EXPERIENCE

**Graduate Research Assistant (Dr. Shane Kraus' Behavioral Addictions Lab) August 2019-May 2024, University of Nevada, Las Vegas**

At UNLV, I work in the Kraus lab, conducting research investigating behavioral addictions (gambling, problematic pornography usage, and compulsive sexual behaviors) and eating disorders. Specifically, I am interested in how impulsivity may drive behaviors within and across addictions and eating disorders (particularly impulsivity in binge eating related disorders). In this lab, I designed studies, received multiple research grants, managed Qualtrics studies, published several manuscripts, provided mentorship, and analyzed data in projects. I have also helped with the development of a manualized treatment, aimed at adapting mindfulness-based relapse prevention for Veterans struggling with substance use and gambling problems.

**Graduate Research Assistant (Dr. Catherine Forestell's flavor preference lab) August 2017-May 2019, The College of William & Mary**

At William & Mary I was a member of the Forestell lab and examined eating habits in young children. I investigated how picky, and food neophobic eating habits were associated with attentional biases towards certain images. I designed studies, ran participants, and analyzed data for projects with guidance from my advisor. I replicated and extended upon previous research for my master's degree thesis.

**Lab team Leader (Professor Raymond Hawkins' sleeping and eating lab) January 2015-January 2016, University of Texas at Austin**

As an undergraduate student, I volunteered with a professor in a psychology lab that studied eating and sleeping habits of college students while attending the University of Texas at Austin. I was a team leader in the lab, which entailed doing data entry, analyzing data from surveys, and teaching other lab members the data entry process. This position greatly helped prepare me to work with lab members and provide mentorship.

## PUBLICATIONS

Kamolova, M., Chen, Y. L., **Etuk, R.,** Sacco, S. J., & Kraus, S. W. (2022). Differences within: Hypersexuality, Sensation Seeking and Pornography Viewing Behaviors in a Sample of Heterosexual, Gay, Bisexual, and Uncertain Men. *Sexual Health & Compulsivity*, 1-23.

**Etuk, R.,** Xu, T., Abarbanel, B., Potenza, M. N., & Kraus, S. W. (2022). Sports betting around the world: A systematic review. *Journal of Behavioral Addictions*, *11*(3), 689-715.

**Etuk, R**., Shirk, S. D., Klein, K. M., Masheb, R. M., Potenza, M. N., Park, C. L., ... & Kraus, S. W. (2022). Examining the Clinical Correlates of Overeating and Binge-Eating Behaviors Among US Veterans. *Military Medicine*, *187*(3-4), 297-303.

**Etuk, R. E**., & Forestell, C. A. (2021). Role of food neophobia and early exposure in children's implicit attentional bias to fruits and vegetables. *Appetite*, *167*, 105647.

**Etuk, R**., Shirk, S. D., Grubbs, J., & Kraus, S. W. (2020). Gambling problems in US military veterans. *Current Addiction Reports*, *7*(2), 210-228.

Kraus, S. W., **Etuk, R**., & Potenza, M. N. (2020). Current pharmacotherapy for gambling disorder: a systematic review. *Expert Opinion on Pharmacotherapy*, *21*(3), 287-296.

## GRANTS AND SCHOLARSHIPS

*Funded*

UNLV International Gaming Institute and Nevada Council of Problem Gambling, Problem Gambling Research Grant
Role: Principal Investigator
Title: Impulsivity, Eating Habits, Physical and Mental Health in Nevadan Patients with Gambling Disorder
Start Date: 10/15/2021
Amount: $3,000

International Center for Responsible Gaming, 2020 Pre-doctoral Network Grant Focused on Sports Wagering Research
Role: Co-Principal Investigator
Title: Sports Betting Around the World: A Systematic Review
Start Date: 6/1/2020
Amount: $5,000

College of Liberal Arts Summer Scholarship, University of Nevada, Las Vegas
Role: Graduate Student
Date Received: 6/4/2020
Amount: $3,000

Arts & Sciences Graduate Research Grant, College of William & Mary
Role: Graduate Research Assistant
Title: Implicit Approach and Avoidance of Foods in Neophobic Children
Start Date: 12/19/2018
Amount: $350

Arts & Sciences Graduate Research Recruitment Fellowship, College of William & Mary
Role: Graduate Student
Date Received: 9/1/2018
Amount: $2,000

Arts & Sciences Graduate Research Grant, College of William & Mary
Role: Graduate Research Assistant
Title: Implicit Attentional Biases in Picky and Food Neophobic Children
Start Date: 7/15/2018
Amount: $350

Arts & Sciences Graduate Research Recruitment Fellowship, College of William & Mary
Role: Graduate Student

Date Received: 9/1/2017
Amount: $2,000

## CLINICAL TRAINING

**August 2020 – August 2021 (Practicum Trainee): The PRACTICE, a UNLV mental health clinic**

At the PRACTICE, I worked as a practicum trainee in a university mental health clinic under the supervision of Dr. Shane Kraus. While there, I treated college students and adults from the Las Vegas community. In individual therapy, I worked with a variety of clients who presented with different diagnoses, including major depressive disorder, tic disorder, eating disorders, anxiety disorders, personality disorders, and substance use disorders. Additionally, I co-facilitated skills training CBT group therapies and performed initial clinical intakes for numerous clients. I primarily used CBT evidence-based therapies at the PRACTICE, including using manualized CBT-SUD, CBT-GAD, CBT-D, and tic disorder protocols. Lastly, I performed four psycho-educational assessments while at the PRACTICE, focusing on educational concerns and testing for learning disabilities and/or ADHD.

**July 2021– July 2022 (Practicum Trainee): Veteran Affairs (VA) Southern Nevada Healthcare System, Las Vegas VA, Residential Recovery and Renewal Center (LVR3) rotation**

I worked as a practicum trainee in a VA medical center under the supervision of Dr. Leandrea Caver and Dr. Eugene Olaiya. During my time here, I worked with Veterans in outpatient services for substance use disorders (Addictive Disorders Treatment Program [ADTP]), in general outpatient psychological services (Behavioral Health Interdisciplinary Program [BHIP]), and within inpatient residential care for substance use/gambling disorder (LVR3). While at the VA, I facilitated group therapies (primarily an anger management group, seeking safety group, grief group, gambling and substance use recovery groups) and performed individual therapy. For individual therapy I provided brief therapy for Veterans in the residential program and long-term individual therapy for Veterans in the outpatient BHIP program. I used several evidence-based treatments (CBT-SUD, CBT-D, and DBT based skill training) while working with Veterans at the VA.

**July 2022– May 2023 (Practicum Trainee): The Eating Disorder Institute of Las Vegas**

The Eating Disorder Institute of Las Vegas (EDI) is a private practice specializing in the treatment of eating disorders. At the EDI, I worked under the supervision of Dr. Lindsey Ricciardi and Dr. Chelsea Powell. At this practicum site, I treated eating disorders in both adolescents and adults from the Las Vegas community. In group therapy at EDI, I facilitated multiple DBT based groups focused on recovery from eating disorders. In individual therapy, I have treated a variety of eating disorders (e.g., AN-R, BED, ARFID) and have used evidence-based treatments and protocols (DBT, CBT-E, and CBT-AR).

**July 2023– July 2024 (Psychology Intern): APA Accredited Predoctoral Clinical Internship at West Virgnia University, School of Medicine (Behavioral Medicine Track)**

As a behavioral medicine intern at the West Virginia University (WVU), School of Medicine, I currently have a major rotation in bariatrics with Dr. Stephanie Cox as my supervisor. In addition, I have worked with multiple other supervisors on minor rotations in the areas of chronic pain, pediatric GI, family weight management, outpatient SUD and residential SUD. Within the bariatric major rotation, I conduct bariatric pre-surgical psychosocial evaluations, see patients for individual therapy focused on disordered eating habits (BED, BN, and restrictive eating behaviors), lead an emotional eating group, and attend monthly bariatric board meetings. My experiences in my minor rotations have varied and include spinal cord stimulator psychological evaluations, initial and return visits in the pediatric GI and family weight management clinics, group co-facilitation, and shadowing individual/group therapies.

## SYMPOSIA AND COLLOQUIA

1. **Etuk, R.** (2018, March). *Implicit attentional biases in picky and food neophobic children.* Symposium presented at the College of William and Mary, Graduate Research Symposium, Williamsburg, VA.

2. **Etuk, R.** (2019, March). *Approach and Avoidance of Foods in Neophobic Children.* Symposium presented at the College of William and Mary, Graduate Research Symposium, Williamsburg, VA.

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3. **Etuk, R**., Xu, T., Abarbanel, B., Potenza, M. N., & Kraus, S.W. (2022, June). *Sports betting around the world: A systematic review*. Symposium presented at the International Conference on Behavioral Addictions, Nottingham, England.

4. Kraus, S.W, **Etuk, R.**, & Griffin, K.R. (2023, March). *Evaluating Mindfulness Based Relapse Prevention at a VA Residential Treatment Facility: A Pilot Study*. Symposium presented at the Nevada State Conference on Problem Gambling, Las Vegas, NV.

## POSTER PRESENTATIONS

1. **Etuk, R.,** Habashy, J., Stevens, K., Culbert, K.M., & Kraus, S.W. (2021, September). *Body Dissatisfaction Mediates the Relationship between Problematic Pornography Use and Disordered Eating Behavior in Men and Women*. Poster presented at the Eating Disorders Research Society (EDRS) Conference, Boston, MA.

2. **Etuk, R.**, Kraus, S.W, & Reid, R.C. (2022, May). *Impulsivity, Physical, and Mental Health in Nevadan Clinical Patients with Gambling Disorder*. Poster presented at the Nevada State Conference on Problem Gambling, Las Vegas, NV.

3. **Etuk, R.,** Kraus, S. W., & Grubbs, J. B. (2023, May). *Prevalence of Binge Eating and Problem Gambling Habits*. Poster presented at the Intentional Conference on Gambling & Risk Taking, Las Vegas, NV.

## INVITED TALKS

1. Kraus, S., W., & **Etuk, R**. (2021, July). Gambling disorder. Two-hour clinical dyadic presentation for UNLV Psychiatry Residents (PG-4).

## TEACHING AND MENTORING EXPERIENCE

August 2017 – May 2019 Teaching Assistant, Department of Psychology,
The College of William & Mary, Williamsburg, VA

- *Underrepresented Scholars in the Academy* (Fall 2017, Fall 2018)- I taught two small classes (one per semester) in which I led class discussions and activities, prepared PowerPoints, and graded essays and projects. I also held office hours to help students with their work.

- *Intro to Psych as a Social Science* (Spring 2018, Fall 2018)- I was a TA for a large intro lecture class where I graded exams and online assignments and held office hours to help students.

- *WMSURE* (Fall 2017-Spring 2019)- I helped a group supporting undergraduate research. I participated and set up workshop panels and provided mentorship to undergraduate students.

August 2021– May 2022 Teaching Assistant, Department of Psychology,
University of Nevada, Las Vegas, Las Vegas, NV

- *Intro Psychology* (Fall 2021, Spring 2022)- I taught four Intro Psychology courses (two per semester) in which I organized the course, graded coursework, held office hours, and gave lectures.

## SKILLS

- Advanced with usage of PsychoPy and E-Prime for experiment generation

- Familiar with coding in Python and advanced in using R, and SPSS

- Advanced skills with Microsoft Excel, Word, PowerPoint, and Google Spreadsheets

- Advanced in using CPRS, EPIC, and OfficeAlly

- Intermediate understanding, speaking, and reading of Spanish

## REFERENCES

**Dr. Shane Kraus- Assistant Professor, UNLV**
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**Dr. Michelle Paul- Professor-in-Residence, UNLV; Former director of The PRACTICE**
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