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Nonmedical Use of Prescription Drugs Among Young Adults: An Examination of Anxiety Sensitivity, Distress Tolerance, and Emotion-Driven Impulse Control Difficulties

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NONMEDICAL USE OF PRESCRIPTION DRUGS AMONG YOUNG ADULTS: AN EXAMINATION OF ANXIETY SENSITIVITY, DISTRESS TOLERANCE, AND EMOTION-DRIVEN IMPULSE CONTROL DIFFICULTIES

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ABSTRACT

Individuals with anxiety disorders are significantly more likely to develop substance use disorders than those without anxiety disorders (Kessler & Greenberg, 2002). Despite a sizeable body of literature focused on etiological and maintenance factors underlying the co-occurrence of substance use and anxiety pathology, this relationship remains poorly understood. Transdiagnostic factors, specifically distress tolerance, anxiety sensitivity, and emotion-driven impulse control difficulties, have been posited to contribute to the relationship of anxiety and substance abuse, and in particular, nonmedical use of prescription drugs (NMUPD; Dennhardt & Murphy, 2013; Wolitzky-Taylor et al., 2015). The current study examined group differences among the aforementioned transdiagnostic factors, and whether they served as mediators in the relation of anxiety and NMUPD in a sample of college students. Participants were 184 undergraduate students at the University of Mississippi who either engaged in past year NMUPD or did not. All participants completed a battery of questionnaires and participated in a laboratory task. Counter to the hypotheses, results indicated that there were not significant differences in the transdiagnostic variables among the two groups, and that none of the transdiagnostic variables mediated the relation of anxiety and NMUPD. Compared to non-drug users, drug users reported more substance use overall, including polysubstance use, and reported more self-medication motives for NMUPD than a similar sample of undergraduate students. The findings are consistent with the extant literature indicating that college students who engage in past year NMUPD are at increased risk for other substance abuse, including simultaneous polysubstance use. Future studies should further examine risk factors for NMUPD among college students.

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INTRODUCTION

Anxiety disorders represent the most frequently occurring mental health disorders in the United States, with a lifetime prevalence rate of 28.8% in the general population (Kessler, Chiu, Demler, & Walter, 2005). Anxiety disorders are associated with significant economic burden and negative outcomes, such as elevated risk of unemployment, lower income, and shortened lifespan (Ettner, Frank, & Kessler, 1997; Jayakody, Danziger, & Kessler, 1998; Kessler & Greenberg, 2002). In addition to these adverse consequences, higher rates of alcohol, nicotine, and illicit drugs (e.g., cannabis, heroin) have been observed among individuals with anxious pathology (Zvolensky & Schmidt, 2004). Indeed, individuals with anxiety disorders are 1.6 to 3.0 times more likely to develop substance use disorders (SUDs) than individuals without anxiety disorders (Kessler & Greenberg, 2002).

The co-occurrence of anxiety disorders and SUDs is associated with greater symptom severity and functional impairment than either disorder alone (Burns, Teesson, & O'Neill, 2005; Magidson, Liu, Lejuez, & Blanco, 2012). Furthermore, co-occurring anxiety symptoms and substance use have a higher prevalence than anxiety disorders alone (Zahradnik & Stewart, 2009). Epidemiological studies have found that 11.9% to 14.9% of individuals with anxiety disorders have a comorbid SUD, and 17.7% to 33.5% of individuals with SUDs have a concurrent anxiety disorder (Grant et al., 2004; Teesson, Slade, & Mills, 2009). Even though research has focused on these frequently co-occurring conditions, more information is warranted to determine which specific substances pose the greatest threat to individuals with pathological

anxiety, and to identify characteristics relevant to anxiety that may amplify problematic substance use.

Both theoretical and empirical evidence support the role of substance abuse as a way to manage aversive emotional states and physiological arousal associated with anxiety (Morris, Stewart, & Ham, 2005; Robinson, Sareen, Cox, & Bolton, 2011; Smith, Feldner, & Badour, 2011; Stewart & Conrod, 2008). Specifically, the self-medication hypothesis and tension-reduction models (herein collectively referred to as the self-medication hypothesis; Comeau, Stewart, & Loba, 2001; Conger, 1956; Khantzian, 1985) posit that individuals engage in substance misuse to reduce preexisting negative affect, such as anxiety symptoms. This theory is based in negative reinforcement, wherein substances are used to reduce anxiety symptoms (Davis, Witcraft, Baird, & Smits, 2017; Eissenberg, 2004; Smith et al., 2011). For instance, when a person has an unpleasant internal experience, such as anxious arousal, distress, or negative affect, s/he might engage in substance use (e.g., alcohol) to reduce the anxiety. Repeated over time, this process creates a learning experience that drinking alcohol reduces anxiety; in other words, drinking alcohol is negatively reinforced by the reduction in anxiety. However, when the substance's short-term effects subside, the chances of the person craving alcohol and drinking alcohol to reduce anxiety is increased due to it being an effective anxiety-reduction strategy in the individual's learning history (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Therefore, this negative reinforcement cycle leads to long-term increases in frequency and intensity of problematic substance use (Eissenberg, 2004; Khantzian, 1985).

In addition to the self-medication hypothesis literature, there is a growing body of empirical and theoretical work that suggests the relation between anxiety and substance misuse may be explained by common third variables or transdiagnostic factors (Tull, Baruch, Duplinsky,

& Lejuez, 2008; Wolitzky-Taylor et al., 2015). Specifically, distress tolerance, anxiety sensitivity, and emotion-driven impulse control difficulties have been found to each play a role in the anxiety-substance abuse link (Allan, Macatee, Norr, Raines, & Schmidt, 2015; Howell, Leyro, Hogan, Buckner, & Zvolensky, 2010; Kaiser, Milich, Lynam, & Charnigo, 2012; Stewart & Kushner, 2001). First, distress tolerance describes the perceived ability or inability to withstand distress and/or other negative emotional states (Simons & Gaher, 2005). Distress tolerance has been associated with increased symptom severity across symptoms of panic disorder, social anxiety disorder, obsessive-compulsive disorder, and anxious worry above and beyond their relationship with general negative affect (Keough, Riccardi, Timpano, Mitchell, & Schmidt, 2010). Additionally, individuals who have decreased levels of distress tolerance (i.e., intolerant of distress) are posited to engage in substance use to cope with negative affective states, such as anxiety (Wolitzky-Taylor et al., 2016). For instance, Howell and colleagues (2010) found that distress tolerance was uniquely related to coping-oriented motives for alcohol use among young adult drinkers.

Although research in this area has primarily relied on self-report measures of distress tolerance, a few studies have demonstrated that behavioral assessments of distress tolerance are associated with negative affect and substance use. For example, Gorka and colleagues (2012) used a behavioral measure of distress tolerance to investigate the role of distress tolerance in the relation of problematic alcohol use and negative affect, finding that negative affect predicted alcohol use problems in individuals with low, but not high, distress tolerance. Similarly, Vujanovic and colleagues (2016) found that self-report and behavioral assessments of distress tolerance were significantly correlated with posttraumatic stress disorder symptoms, above and

beyond past month substance use, among participants who had experienced a potentially traumatic event.

The second transdiagnostic factor important to the anxiety-substance abuse link is anxiety sensitivity, which refers to the trait-like fear that the experience of anxiety will result in catastrophic consequences, such as panic, illness, or social embarrassment (Reiss, Peterson, Gursky, & McNally, 1986). Of note, factor analytic evidence suggests that distress tolerance and anxiety sensitivity are related, yet distinct, as distress tolerance encompasses a wider range of aversive states (e.g., sadness, anger) and maladaptive reactions to distress (e.g., behavioral, emotional; Bernstein, Zvolensky, Vujanovic, & Moos, 2009; Howell et al., 2010; Wolitzky-Taylor et al., 2015). Extensive empirical and theoretical research have established anxiety sensitivity as a transdiagnostic factor across many psychopathologies, including anxiety and problematic substance use (Boswell et al., 2013; Tull et al., 2008).

Numerous studies support the unique role of anxiety sensitivity in explaining the co-occurrence of anxiety and SUDs (Stewart & Kushner, 2001). For instance, Dixon and colleagues (2014) found that high anxiety was positively associated with illicit substance abuse in individuals with elevated anxiety sensitivity, but not in those with nonclinical levels of anxiety sensitivity, suggesting that trait anxiety alone does not predict substance abuse. Consistent with the self-medication hypothesis, anxiety sensitivity has been associated with increased substance abuse frequency among inpatients with anxiety disorders (DeHaas, Calamari, & Bair, 2002), and has been linked to coping-related motives for alcohol (Berenz et al., 2016), cannabis (Bonn-Miller, Zvolensky, & Bernstein, 2007), and nicotine (Gonzalez, Zvolensky, Vujanovic, Leyro, & Marshall, 2008). In addition, anxiety sensitivity has been found to be integrally involved in the relation of anxiety and substance misuse. One prospective study found that anxiety sensitivity

uniquely predicted the development of alcohol use disorders over and above trait anxiety, indicating that anxiety sensitivity may play a bigger role in the misuse of alcohol than anxiety alone (Schmidt, Buckner, & Keough, 2007).

Lastly, emotion-driven impulse control difficulties refer to the propensity to engage in undesired behavior, such as substance abuse and risky sex, when experiencing negative emotions (Gratz & Roemer, 2004; Weiss, Tull, Anestis, & Gratz, 2013; Whiteside & Lynam, 2001). Emotion-related impulsivity has been associated with anxiety, avoidance of anxiety, and substance abuse (Acton, 2003; Weiss et al., 2013; Wolitzky-Taylor et al., 2015). With regard to anxiety pathology, studies have found that negative urgency, or impulsivity driven by negative affect, is associated with increased worry (Pawluk & Koerner, 2013), obsessions (Cougle, Timpano, & Goetz, 2012), and increased engagement in risky behaviors among both anxious and nonclinical samples (Guillot, Pang, & Leventhal, 2014; Weitzman, McHugh, & Otto, 2011). Studies suggest that individuals with substance use disorders tend to use maladaptive emotion regulation strategies, and have more emotion regulation deficits overall than those who do not abuse substances (Fox, Axelrod, Paliwal, Sleeper, & Sinha, 2007; Fox, Hong, & Sinha, 2008; Weiss et al., 2013). Additionally, it has been hypothesized that during emotional states, impulse control may fail as a result of giving primacy to affect regulation during states of being emotionally distraught (Tice, Bratslavsky, & Baumeister, 2001). For instance, following a sad mood induction, when participants are not instructed that their mood will be stagnant, then they tend to eat increased amounts of fatty foods in response to distress because they expect that doing so will make them feel better (i.e., negative reinforcement; Tice et al., 2001).

Emotion-driven impulse control difficulties have been posited to have a causal relationship with substance use, wherein increases in uninhibited impulsivity lead to increases in

substance use during highly emotional states (Smith & Cyders, 2016). Prior studies have found that elevated negative urgency is linked to increased cannabis use (Kaiser et al., 2012), nicotine use (Guillot et al., 2014), and alcohol use (Menary et al., 2015). Additionally, negative urgency has been found to moderate the relationship between anxiety sensitivity and smoking cessation outcomes and abstinence expectancies (Guillot et al., 2014), as well as the effect of anxiety on alcohol dependence (Menary et al., 2015).

Several investigations have examined distress tolerance, anxiety sensitivity, and emotion-driven impulse control difficulties in attempt to better understand anxiety and substance use. For example, results from an empirical study investigating marijuana use suggest that both distress tolerance and anxiety sensitivity contribute to different self-medication motives for use, as both distress tolerance and anxiety sensitivity were related to coping-oriented motives, but only anxiety sensitivity was related to conformity-oriented motives (Zvolensky et al., 2009). Another study found that negative urgency accounted for significant variance in the relation between anxiety sensitivity and smoking behaviors, suggesting that smokers high in anxiety sensitivity are likely to react impulsively when experiencing negative affect compared to those lower in anxiety sensitivity (Guillot et al., 2014). Lastly, a study examining substance use, distress tolerance, and negative urgency in a sample of first-year college students found that only negative urgency was significantly associated with all substance use outcomes (i.e., alcohol, marijuana, tobacco, and illicit drugs), above and beyond trait negative affect (Kaiser et al., 2012). Taken together, these findings further inform the self-medication model and suggest that distress tolerance, anxiety sensitivity, and emotion-driven impulse control difficulties importantly influence substance use. Unfortunately, the literature in this area is underdeveloped and few studies have simultaneously examined these constructs in relation to anxiety and substance use.

To date, only one study has concurrently examined the impact of distress tolerance, anxiety sensitivity, and negative emotion-driven impulsivity on alcohol and cannabis use in adolescents (Wolitzky-Taylor et al., 2016). This study demonstrated that negative emotion-driven impulsivity was the only significant, unique mediator in the relationship between anxiety pathology and alcohol and cannabis use, after accounting for the effects of distress tolerance and anxiety sensitivity (Wolitzky-Taylor et al., 2016). That is, higher levels of anxiety symptoms were associated with greater alcohol-use and cannabis-use problems, respectively, through increased impulsivity (Wolitzky-Taylor et al., 2016). These findings suggest that emotion-driven impulse control difficulties may be particularly important in the relation between anxiety and problematic substance use.

Research has primarily focused on understanding the associations between anxiety pathology and alcohol and nicotine use, with fewer studies examining illicit substance (e.g., marijuana, heroin) and prescription medication abuse (Zvolensky & Schmidt, 2004). Notably, prescription drug abuse is a rapidly increasing problem among adolescents and adults across the world. Throughout the past ten years, the 12-month prevalence rate of abuse and dependence of prescription drugs increased 67% (Blanco et al., 2007), which is largely a result of illegal use rather than medical use (Arria & DuPont, 2010; Wu & Blazer, 2011; Young, Glover, & Havens, 2012). Indeed, the 2011 National Survey on Drug Use and Health (NSDUH) indicated that 6.1 million people aged twelve and older had used prescription drugs recreationally within the previous month (Substance Abuse and Mental Health Services Administration [SAMHSA], 2015). Over this span of time, prescription drug abuse has come to represent a significant economic burden (Birnbaum et al., 2006; Hansen, Oster, Edelsberg, Woody, & Sullivan, 2011), and has been associated with a range of adverse outcomes including incarceration (Serxner,

Gold, & Bultman, 2001), absenteeism (Birnbaum et al., 2006), and even death (Van Hasselt, Keyes, Bray, & Miller, 2015).

The nonmedical use of prescription drugs (NMUPD) occurs when prescription medications are obtained from a nonmedical source (e.g., a classmate), not taken as prescribed (e.g., more than the prescribed dosage), or used for a nonmedical or recreational purpose (e.g., to get high, to stay up later; Kelly, Rendina, Vuolo, Wells, & Parsons, 2015). The major categories of frequently abused prescription drugs are stimulants (e.g., amphetamines), opioid pain relievers (e.g., Oxycodone), and sedatives (e.g., anxiolytics; National Institute on Drug Abuse [NIDA], 2011). Holloway and Bennett (2012) posit two types of prescription drug misuse: 1) using a prescribed medication in a way that was not intended; and 2) using prescription drugs that are sold, traded, or given away. One study found that 17% of adolescents sold, traded, or gave away their prescription, while 12% kept their prescription but used it in a way in which it was not prescribed. In total, 40% of students reported some combination of the aforementioned misuse (Holloway & Bennett, 2012). Consistent with these findings, another study found that 14.7% of students reported giving their prescribed stimulant to friends (Poulin, 2001).

Although NMUPD is at an all-time high across all age groups, adolescents and young adults (collectively referred to as youth) are especially vulnerable to misusing prescription medication, largely because of the misconception that they are safe to abuse due to their prescribed nature (Arria & DuPont, 2010; Wu & Blazer, 2011; Young et al., 2012). Indeed, a study examining substance use patterns over the course of ten years indicated that the significant increase in NMUPD is most notable among young adults between the ages of 18 and 34 (Blanco et al., 2007). In 2013, the percentage of adolescents who reported recreational use of prescription drugs on at least one occasion was approximately one-in-four, which is a 33% increase from

2008 (NIDA, 2013). In addition, national survey data indicated that of individuals aged 18 – 25, 44% reported using prescription drugs and 15% reported misuse of prescription drugs in the past year (SAMHSA, 2015). Prescription drugs are also quickly becoming one of the most commonly used illicit drugs. On college campuses, NMUPD is second only to marijuana use (Grant et al., 2004; Johnston, O'Malley, & Bachman, 2003), and NMUPD has increased four times more than cannabis use disorders over the course of ten years (Blanco et al., 2007).

The increase in the rates of NMUPD among youth has been attributed to the over-prescribing of prescription drugs and the ease of access (Centers for Disease Control and Prevention [CDC], 2014; NIDA, 2013). Adolescents falsely believe that these drugs are safer than illicit drugs because they are prescribed by medical professionals (Netemeyer, Burton, Delaney, & Hijjawi, 2015), which may pose dangerous, unanticipated risks, such as negative side effects and interactions with other substances (e.g., alcohol; McCabe, Boyd, & Teter, 2009). Elevated levels of anxiety symptoms have been posited as a significant vulnerability of NMUPD in youth (Blanco et al., 2007; Hall, Howard, & McCabe, 2010; McCabe et al., 2009; Viana et al., 2012). Data collected from over 43,000 individuals found that those with a history of an anxiety disorder were more likely to develop NMUPD than those without a history of anxiety (Blanco et al., 2007). Similarly, one study found that individuals with clinically significant levels of panic and social anxiety symptoms were two times more likely to be at risk for NMUPD than those with nonclinical symptoms (Viana et al., 2012). In another study, health anxiety was shown to be a risk factor for NMUPD (Jeffers et al., 2015). At the same time, negative emotion-driven impulsivity has been shown to be associated with illicit substance use among college students (Kaiser et al., 2012). Specifically, Blanchard and colleagues (2017) found that females reporting NMUPD, both over the lifetime and within the past month, had significantly higher rates of

negative emotion-driven impulsivity than those who did not report NMUPD. Together these studies suggest that anxiety and related vulnerability factors may play a key role in NMUPD.

Given the increasing rates of NMUPD among youth, college students are a particularly important population for informing risk prevention and intervention programs (Arria & DuPont, 2010; Blanco et al., 2007; Wu & Blazer, 2011; Young et al., 2012). College students present as a uniquely vulnerable population due to the high rates of anxiety (Eisenberg, Gollust, Golberstein, & Hefner, 2007), polysubstance drug abuse (Arria et al., 2008; McCabe, Teter, Boyd, Knight, & Wechsler, 2005), and easy access to substances (Gliksman, 1988) that may occur at higher rates in college as compared to other times throughout one's life. Further, Blanchard and colleagues (2017) found that emotion-related impulsivity differentially predicted nonmedical use of depressants among college students. Accordingly, the purpose of the current study is to compare transdiagnostic anxiety factors (i.e., distress tolerance and anxiety sensitivity) and emotion-driven impulse control difficulties between college students with and without NMUPD in the past year.

Aim 1: To examine anxiety, trait variables, NMUPD, and related factors among a sample of college students.

Hypothesis 1: NMUPD will be significantly positively associated with trait anxiety, distress tolerance, anxiety sensitivity, and emotion-driven impulse control difficulties.

Hypothesis 2: Compared to individuals without past-year NMUPD, individuals with a history of NMUPD will report significantly higher levels of anxiety, anxiety sensitivity, and emotion-driven impulse control difficulties, and significantly lower levels of distress tolerance. Additionally, reporters of NMUPD are expected to endorse more adverse outcomes that have

been associated with NMUPD, such as stressful events, self-medication motives, and frequency and diversity of substance use (Arria et al., 2008; McCabe et al., 2005, 2009).

Hypothesis 3: This study seeks to examine Wolitzky-Taylor et al.'s (2016) mediation model in a cross-sectional sample of college students by examining the role of distress tolerance, anxiety sensitivity, and emotion-driven impulse control difficulties in the relation between anxiety and NMUPD. Wolitzky-Taylor and colleagues (2016) found a significant indirect effect of negative emotion-driven impulsivity, but not distress tolerance and anxiety sensitivity, in the relation between anxiety and substance misuse. Given prior work among college students (Ali, Ryan, Beck, & Daughters, 2013; Berenz et al., 2016), it is expected that anxiety will be indirectly associated with NMUPD through distress tolerance (both self-reported and behaviorally measured), anxiety sensitivity, and emotion-driven impulse control difficulties. Furthermore, in line with the extant literature (e.g., Guillot et al., 2014; Kaiser et al., 2012; Wolitzky-Taylor et al., 2016), it is also predicted that the indirect effect of emotion-driven impulse control difficulties will be more robust as compared to the indirect effects of distress tolerance and anxiety sensitivity in the relation between anxiety and NMUPD.

METHOD

Participants

Participants were 184 (M_{age} = 18.85, 75.5% female) undergraduate students who were primarily in their freshman year of college (71.2%) recruited from the Department of Psychology's Sona Systems pool of undergraduate students at the University of Mississippi, a large, southeastern public university. Participants were 71.7% White, 16.8% Black or African American, 6.0% Asian, 3.8% biracial, and 1.6% other. Only 4.3% of participants identified as Hispanic or Latino. All individuals who fell outside of the age range of 18 to 25 (i.e., emerging adulthood) were excluded from the study (Arnet, 2000). Otherwise, participants were eligible.

Measures

The Alcohol Use Disorders Identification Test (AUDIT). The AUDIT (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) is a 10-item self-report questionnaire developed by the World Health Organization to screen for harmful and hazardous alcohol use. Items are rated on a 5-point Likert scale from 0 to 4, with higher scores indicating more frequent use and a broader domain of interference. A clinical cutoff value of eight distinguishes hazardous drinking from more serious harmful drinking. The AUDIT has three subscales: hazardous alcohol use (e.g., "how many drinks containing alcohol do you have on a typical day when you are drinking?"), symptoms of dependence (e.g., "how often during the last year have you found that you were not able to stop drinking once you had started?"), and harmful alcohol use (e.g., "have you or someone else been injured as a result of your drinking?"). The AUDIT has demonstrated good construct validity via its correlation with alcohol use risk factors, reasons for drinking,

negative affect, and withdrawal symptoms (Bohn, Babor, & Kranzler, 1995). Additionally, the AUDIT is able to differentiate alcoholics from non-alcoholics, and demonstrates superior discriminant ability over and above the Michigan Alcoholism Screening Test (Bohn et al., 1995). In the current study, the AUDIT demonstrated adequate reliability (Cronbach's α = 66). See Appendix A for the AUDIT.

Anxiety Sensitivity Index – 3 (ASI-3). The ASI-3 (Taylor et al., 2007) is an 18-item self-report measure of anxiety sensitivity severity and frequency. Anxiety sensitivity is measured on a 5-point Likert scale from 0 ("very little") to 4 ("very much"). The ASI-3 assesses the potential catastrophic physical, cognitive, and social consequences of anxiety. The suggested clinical cutoff for the ASI-3 is a total score of 23, which indicates clinically significant levels of anxiety sensitivity, and suggests impairment or distress due to symptoms (Allan, Korte, Capron, Raines, & Schmidt, 2014; Allan, Raines, et al., 2014). The ASI-3 subscales have demonstrated good convergent and divergent validity, as they have been shown to be highly correlated with the original Anxiety Sensitivity Index, such that correlations among similar subscales were significantly larger compared to correlations among dissimilar subscales (Taylor et al., 2007). The ASI-3 further demonstrates convergent and divergent validity by its ability to distinguish individuals with general anxiety and depressive symptoms (high associations) from those with psychosis and self-harming behaviors (low associations) in a sample of highly comorbid individuals (Rifkin, Beard, Hsu, Garner, & Björgvinsson, 2015). The ASI-3 has demonstrated good to excellent internal consistency overall (Cronbach's α = .93) in both clinical and undergraduate samples (Wheaton, Deacon, McGrath, Berman, & Abramowitz, 2012). However, in the current study, the ASI-3 demonstrated poor reliability (α = .58). See Appendix B for the ASI-3.

College Student's Stressful Event Checklist (CSSEC). The CSSEC (Holmes & Rahe, 1967) is a self-report measure of the presence of 32 stressful events experienced by college students. Participants place an "X" beside events that they have experienced or events that they expect to occur soon. Each event has a predetermined rank and corresponding value (20 to 100, 20 being the lowest ranked event and 100 being the highest ranked event) that reflects the severity of the event. For example, "death of a close family member" is ranked number one and assigned the highest value of 100, while "minor traffic violations" is ranked 32 and assigned the lowest value of 20. All event values are summed for a total score, which indicates mild (< 150), moderate (150 to 300), or severe (> 300) stress. The CSSEC is adapted from Holmes and Rahe's (1967) Social Readjustment Rating Scale (SRRS), which is designed for an adult population, and as such the items are tailored to adulthood stressors (e.g., divorce, fired at work, son or daughter leaving home). The original SRRS evidenced adequate interrater reliability (Kendall's coefficient of concordance = 0.48; Holmes & Rahe, 1967). In the present study, the CSSEC demonstrated adequate internal consistency ($\alpha = .74$). See Appendix C for the CSSEC.

Depression Anxiety Stress Scale – 21 (DASS-21). The DASS-21 (Lovibond & Lovibond, 1995) is a 21-item self-report measure of symptoms associated with depression, anxiety, and stress. Items are rated on a 4-point Likert scale from 0 ("did not apply to me at all") to 3 ("applied to me very much, or most of the time"), with higher scores indicating greater levels of distress. The DASS-21 is adapted from the 42-item DASS, and as such, scores on the 21-item version are doubled so as to make interpretation equivalent across the two versions. The anxiety subscale (e.g., "I experienced trembling (e.g., in the hands)") measures physiological symptoms of anxiety, while the stress subscale (e.g., "I found myself getting agitated") measures cognitive symptoms of anxiety. The current study only used the 7-item anxiety subscale of the

DASS-21. The DASS-21-Anxiety has displayed good psychometric properties in individuals diagnosed with an anxiety or depressive disorder, by demonstrating good internal consistency (α = .87) and concurrent validity (Antony, Bieling, Cox, Enns, & Swinson, 1998). In the current study, the DASS-21-Anxiety evidenced adequate internal consistency (α = .68). See Appendix D for the DASS-21-Anxiety.

Difficulties in Emotion Regulation Scale (DERS). The DERS (Gratz & Roemer, 2004) is a 36-item self-report measure of emotion regulation difficulties. Items are rated on a 5-point Likert scale from 1 ("almost never") to 5 ("almost always"), with higher scores indicating more difficulties regulating emotions. The DERS consists of six subscales, including nonacceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. In the current study, the 6-item impulse control difficulties subscale (DERS-Impulse) was used as a measure of emotion-driven impulse control difficulties. Test-retest reliability for the DERS-Impulse was adequate (ρ = .57) in a sample of undergraduate students (Gratz & Roemer); however, the test-retest sample only consisted of 21 participants, which might account for low reliability. Further, the DERS-Impulse has demonstrated good predictive validity (Gratz & Roemer, 2004) and has been positively associated with other measures of emotion-driven impulse control difficulties (r = .64; Weiss et al., 2013). In the current study, the DERS-Impulse evidenced adequate internal consistency (α = .68). See Appendix E for the DERS-Impulse.

Distress Tolerance Scale (DTS). The DTS **(**Simons & Gaher, 2005) is a 15-item self-report measure of distress tolerance, or the perceived ability to handle distress. Raters indicate to what extent they agree with each item on a 5-point Likert scale from 1 ("strongly agree") to 5

("strongly disagree"), with higher scores indicating greater ability to tolerate distress. The DTS is comprised of four subscales: tolerance (perceived ability to tolerate and endure emotions), absorption (attention that is occupied by emotions), appraisal (assessment of emotions as acceptable), and regulation (perceived ability to manage emotions). Further, Simons and Gaher (2005) found that the DTS demonstrated good divergent validity, as it is negatively associated with measures of affective distress (r = -.59) and affective lability (r = -.52). Additionally, the DTS was positively correlated with measures of mood acceptance (r = .47) and negative mood regulation (r = .54), indicating convergent validity (Simons & Gaher, 2005). Lastly, the DTS has also been shown to be negatively related to measures of alcohol and marijuana use, such that increased distress tolerance was associated with decreased use of alcohol (r = -.23) and marijuana (r = -.20; Simons & Gaher, 2005). The DTS has shown adequate test-retest reliability (r = .61; Simons & Gaher, 2005) in undergraduates and excellent internal consistency in the current study (α = .91). See Appendix F for the DTS.

Marlowe-Crowne Social Desirability Scale – Short Form (M-C). The M-C short form (Reynolds, 1982) is an abbreviated version of the original 33-item scale (Crowne & Marlowe, 1960). This 13-item true/false self-report questionnaire assesses social desirability, or the tendency to influence one's scores by "faking good" or "faking bad" in order to present the way that is expected of the participant (Meehl & Hathaway, 1946). Lower scores represent less response bias, whereas higher scores represent greater social desirability. Previous studies investigating prescription opioid abuse have used the M-C as a measure of social desirability (e.g., Butler et al., 2007), and one found that individuals reporting less social desirability were typically men who reported craving their prescribed opioids (Wasan et al., 2009). In the current study, the M-C was used to examine social desirability, which may affect responding given the

sensitive questions on drug use. Consistent with its use in prior work, it would be expected that individuals in the non-drug use group would report higher social desirability, which would indicate potential inaccurate responding (Reynolds, 1982). The 13-item M-C has demonstrated excellent convergent validity with the original 33-item M-C (r = .93; Reynolds, 1982). Moreover, the 13-item short form has demonstrated adequate incremental validity ($r_{KR\text{-}20}$ = .76) that is comparable to the original 33-item. However, in the current study, the M-C demonstrated poor reliability (α = .36), and results should be interpreted with caution. See Appendix G for the M-C.

Nonmedical Prescription Drug Motives Questionnaire (NMPD-MQ). The NMPD-MQ (Milner, 2015) is a 20-item self-report questionnaire assessing motives for using prescription drugs nonmedically. Items are rated on a 5-point Likert scale from 1 ("almost never/never") to 5 ("almost always/always"). Items are adapted from the Modified Drinking Motives Questionnaire – Revised (DMQ-R; Cooper, 1994) and the Marijuana Motives Measure (Simons, Correia, Carey, & Borsari, 1998). The NMPD-MQ has four subscales determined by factor analysis: Self-medication (e.g., "to escape from your life"), social/recreation (e.g., "because it gives you a pleasant feeling"), performance (e.g., "to help focus"), and conformity (e.g., "so that others won't kid you about not doing it"). In an unpublished dissertation, Milner (2015) demonstrated convergent validity, evidenced by positive correlations between the self-medication subscale and the DMQ-R coping subscale, the social/recreation subscale and the DMQ-R enhancement subscale, the performance subscale and the DMQ-R social subscale, and the conformity subscale and the DMQ-R conformity subscale. In addition, this study demonstrated divergent validity for the NMPD-MQ as each subscale was negatively correlated with other dissimilar measures (e.g., self-medication was negatively related to positive affect and

sensation seeking). The NMPD-MQ demonstrated excellent internal consistency overall ($\alpha = .94$) in the current sample of college students. See Appendix H for the NMPD-MQ.

Use of Prescription Drugs Questionnaire. As there is no standardized measure to assess NMUPD broadly, this questionnaire was developed by the author to measure NMUPD. Items included: type of drug(s) used, type of use (i.e., using as prescribed or nonmedical use), frequency and quantity of use, and polysubstance drug use. The primary outcomes of interest include dichotomous reporting of past-year NMUPD (i.e., yes/no) and the frequency of NMUPD (i.e., "never" to "multiple times a day"). Additionally, all participants were asked to list the medication(s) used in the past year and indicate under which circumstances the medication was used within the respective classification (i.e., stimulants, sedatives, opioid painkillers). See Appendix I for the Use of Prescription Drugs Questionnaire.

Sociodemographic Questionnaire and General Medical History. Participants reported their age, sex, race and ethnicity, year in school, current GPA, number of courses taken in the semester of their participation, major, and health insurance status. Also, participants reported substance use over the past year (i.e., alcohol, caffeine, tobacco, illicit drugs) and medical history, including items assessing lifetime occurrence of common medical problems, current or lifetime enrollment in therapy, and past-year prescribed and over-the-counter medications. See Appendix J for the Sociodemographic Questionnaire and General Medical History.

Mirror Tracing Persistence Task – Computerized (MTPT-C). The MTPT-C (Strong et al., 2003) is a behavioral task designed to elicit psychological distress and to measure goal-directed action in the context of distress. Participants are instructed to trace three increasingly difficult geometric shapes on a computer screen. Unbeknownst to the participant, the computer mouse is programmed to move in the opposite direction of its physical movement. When a

participant deviates from the line s/he is supposed to trace or stops moving the mouse for two seconds, a loud buzzer sounds and s/he is forced to begin the level again. Participants are given the option to quit at the fourth presentation of the geometric shape, which is the same level of difficulty as the previous shape (i.e., difficult). The first three rounds each last for one minute, while the fourth lasts up to seven minutes depending on when the participant quits the task. The primary outcome is latency to quit, which is measured in seconds.

The MTPT-C has evidenced convergent validity in a depressed sample, such that depressed individuals terminate the task more quickly than non-depressed individuals (Ellis, Vanderlind, & Beevers, 2013). Further, there is evidence of predictive validity in that persistence on the MTPT-C can predict smoking cessation success, such that individuals who persist longer have more successful quit attempts (Steinberg et al., 2012). Behavioral measures of physiological and cognitive distress tolerance have been shown to be correlated with each other (McHugh et al., 2011; McHugh & Otto, 2011). However, the literature broadly indicates that behavioral measures of distress tolerance are poorly correlated with self-reported measures of distress tolerance. Indeed, both Glassman et al. (2016) and McHugh et al. (2011) found that the DTS and MTPT-C were not correlated (r = .05 and r = .07, respectively). This discrepancy suggests that there may be differences in the constructs assessed by the self-report and behavioral measures. Alternatively, the term "distress tolerance" may be multifaceted and comprise cognitive and physiological components of tolerating distress.

Procedure

Overview. The study protocol received approval from the University of Mississippi's Institutional Review Board (IRB). All eligible participants were categorized in either the drug use or non-drug use group, and both groups completed a laboratory session including

questionnaires and the MTPT-C. Participants earned 1.0 hours of course credit for their participation.

Recruitment. Students in psychology courses enrolled in the study via Sona Systems, an online study recruitment pool. An initial screening measure was included in the Sona screener to assess for past-year use of prescription drugs. Past-year use of prescription drugs was assessed rather than past-year nonmedical use due to the inclination of participants to provide inaccurate, yet socially desirable responses to these questions that may result in high rates of false negatives, as well as potential IRB concerns about confidentiality in the Sona screener and the illegal nature of NMUPD. Eligible participants were identified and invited via e-mail to sign up for the study, and those who reported using prescription drugs in the past year were encouraged to participate to ensure adequate power in the drug use group.

Group Identification. Upon entering the lab, the informed consent process was reviewed with the participants by a trained research assistant. Written informed consent was obtained from interested individuals. First, participants completed the Use of Prescription Drugs Questionnaire (see Appendix I). Upon completion of the questionnaire, research assistants determined whether participants' reported drug use met criteria for the drug use group or the non-drug use group. The drug use group was determined in accordance with the definition of NMUPD, which consisted of five items from the Use of Prescription Drugs Questionnaire. Participants who responded "yes" to using prescription medications 1) not prescribed to them, 2) taken beyond the amount they were told to take, and 3) for reasons other than how they were prescribed were assigned to the drug use group. Additionally, if participants reported using nonmedically or recreationally on at least one occasion within the past year or using more than the prescribed dosage (i.e., ≥ 1.5 times the prescribed dosage), they were classified in the drug use group. In the case of an individual

who initially reported no prescription drug use on the screener and then reported NMUPD in the lab, this individual was included in the drug use group. The non-drug use group was comprised of participants who reported no prescription drug use or abuse and/or reported medical use in the past year.

Group assignment into the drug and non-drug use groups were checked by multiple investigators to ensure fidelity to the definition of NMUPD and to address anomalies, including unclear responding to NMUPD items. The study's principal investigator and co-investigator discussed discrepancies in group assignment based on predetermined decision rules. Drug use information was kept separate from outcome data; therefore, all coders were blind to how the participant responded to key variables, thereby reducing potential bias when resolving discrepancies. See Appendix K for the group assignment flowchart.

Laboratory Session Procedures. Participants completed a brief packet of online questionnaires via Qualtrics, including the AUDIT, ASI-3, CSSEC, DASS-21-Anxiety, DERS-Impulse, DTS, M-C, NMPD-MQ, and the Sociodemographic Questionnaire and General Medical History (see Appendices A through H and J). Then participants participated in the MTPT-C (Strong et al., 2003). Upon completion of the laboratory session study procedures, participants received a debriefing describing the purpose of the study.

In regard to the setting of the laboratory session, between one and ten participants completed the study at a time. A step was taken early in data collection to protect participants' confidentiality, such that participants turned in the Use of Prescription Drugs Questionnaire in an manila envelope labeled "confidential." Additionally, participants wore headphones or earphones during the MTPT-C in order to reduce ambient noise.

Data Analysis

Power Analysis. Preliminary data collection suggested a medium between-groups effect size (Cohen's $d = .61$) on the ASI-3. These data were used to conduct an a priori power analysis, which indicated that, for independent samples *t*-tests, a sample size of at least 86 participants, 43 per group, was required to observe a medium between-group effect size using the parameters of a two-tailed test with alpha level of .05 and power of .80 (G*Power; Erdfelder, Faul, & Buchner, 1996). Further, a review of the literature suggests that in order to achieve .80 power, a sample size of approximately 143 is needed to detect mediation (Fritz & MacKinnon, 2007).

Data Cleaning Procedures. Statistical analyses were performed using SPSS Version 25 (IBM Corp., 2017). Data were screened for accuracy errors, missing data, outliers, and assumptions. Of the 193 original participants, one participant was excluded for being outside of the appropriate age range, two participants were excluded for discrepant group assignment data, and six multivariate outliers were excluded using Mahalanobis distance. Data additionally met assumptions of multicollinearity, normality, linearity, homogeneity, and homoscedasticity. The final sample consisted of 184 participants, 115 in the non-drug use group and 69 in the drug use group. Between-group analyses were conducted to examine potential differences between the two groups that may have affected responses with regard to demographics and social desirability.

Sample Characteristics. Type of misuse, frequency of use, and concurrent use of other substances were examined among the drug use group, and use of prescription drugs in general was examined among the full sample, including frequency of classes of prescription drugs used (i.e., stimulants, sedatives, and opioids), other prescribed medication (e.g., antidepressants), and alcohol and illicit drug use.

Examination of Hypotheses 1 and 2. Point-biserial correlations were used to test associations between NMUPD and transdiagnostic variables (Hypothesis 1). Next, a series of independent samples *t*-tests were conducted to test Hypothesis 2 that compared to individuals without past-year NMUPD, individuals engaging in NMUPD would report significantly higher levels of anxiety, anxiety sensitivity, and emotion-driven impulse control difficulties, and significantly lower levels of distress tolerance, in addition to greater occurrence of stressful life events and greater diversity of substance use. Additional independent samples *t*-tests were utilized to examine group differences in alcohol use and polysubstance use (i.e., using another substance simultaneously with prescription drugs). Further, self-medication motives were not examined in the non-drug use group since this measure is only relevant to individuals who misuse prescription drugs. Therefore, Spearman correlations were used to assess the association between self-medication motives and frequency of prescription drug use, while a one sample *t*-test was utilized to compare the self-medication motive mean of the current study to that of college-age prescription drug users from another study (Milner, 2015).

Hypothesis 3 (Multiple Parallel Mediation). Multiple parallel mediation models were used to test Hypothesis 3, that anxiety would be associated with NMUPD via anxiety sensitivity, distress tolerance, and emotion-driven impulse control difficulties (see Figure 1). In multiple parallel mediation each mediator is simultaneously entered, which allows for each mediator to be examined while at the same time, accounting for shared variance between the other mediators. The PROCESS version 2.16 macro for SPSS was used to test the multiple mediation models (Hayes, 2013). PROCESS uses ordinary least squares regression with bootstrapping to estimate the indirect effects and to obtain confidence intervals for mediation models. Bias-corrected bootstrapping of 10,000 re-samples were used to calculate unstandardized beta (*b*) coefficients,

standard errors (*SE*), and 95% confidence intervals (95% *CI*) for all indirect (paths a^1*b^1, a^2*b^2, and a^3*b^3), direct (path *c'*), and total effects (path *c*). Confidence intervals that contain zero signify non-significant effects indicating that mediation is not present.

Two parallel mediation models were tested to examine the relation of anxiety and NMUPD through various transdiagnostic mediators. The first model examined self-reported anxiety sensitivity, distress tolerance, and emotion-driven impulse control difficulties as mediators. The second model differed only in that behaviorally measured distress tolerance, rather than self-reported distress tolerance, was tested as a mediator.

RESULTS

Participant Characteristics

Chi-square goodness of fit and independent samples *t*-tests were used to test group differences in sex, age, and ethnicity, which indicated that there were no significant differences between groups (all *p*'s > .21). Social desirability was examined between the two groups as a potential confounding factor, and findings indicated that the drug use group reported more social desirability ($M = 8.07$, $SD = 1.76$) than the non-drug use group ($M = 7.39$, $SD = 2.35$; t (173.11) = -2.24, 95% CI [-1.28 – -0.08], $p = .027$).

In total, 37.5% ($n = 69$) of the sample reported past-year NMUPD. Of these participants, 34.8% reported misusing their own prescription by using more than the prescribed dose and 29.0% used for reasons other than prescribed. Additionally, 59.4% reported using a medication that was not prescribed to them. With regard to NMUPD frequency, 29.0% reported doing so once, 27.5% reported monthly, 7.2% reported weekly, 5.8% reported 2 – 3 days a week, 14.5% reported daily, 2.9% reported multiple times a day, and 1.4% reported nonmedical use "randomly." Lastly, 40.6% of the drug use group endorsed simultaneous polysubstance use, mixing prescription medication with other substances (i.e., primarily alcohol and marijuana).

Among the total sample, 29.9% reported use of stimulants in the past year, which was primarily comprised of Adderall. In addition, 12.5% of the sample reported use of sedatives, including sleeping pills such as Trazodone and Ambien, and antianxiety medication such as Xanax and Klonopin. Lastly, 15.8% of the sample reported use of opioids, which primarily included hydrocodone. Notably, not all participants provided this information even if they did

report using prescription drugs. Furthermore, it is conceivable that college students may not know whether or not their use qualifies as abuse, and further, they may not know the exact medication and dose that they are using. Of the total sample, 10.3% reported past-year use of other prescribed medications, including antidepressants (i.e., citalopram), headache medication (i.e., Topamax), and over-the-counter pain relievers (e.g., naproxen). Regarding alcohol use, 9.2% of the sample scored in a range indicative of potential alcohol abuse, which is considerably lower than a nationally representative sample of undergraduate students (i.e., 31.6%; Knight et al., 2002). Indeed, the median frequency of past-year alcohol use was "less than monthly," indicating that half of the sample reported never using alcohol in the past year, and half reported using monthly or weekly. Additionally, 16.1% of the entire sample reported past-year illicit drug use, including marijuana (16.5%), cocaine (2.3%), and hallucinogens (0.6%).

Regarding psychological characteristics, the overall sample endorsed a low level of anxiety (M = 1.89, SD = 3.34) which fell in the normal range, a subclinical level of anxiety sensitivity (M = 15.97, SD = 4.90), and a "severe" level with regard to stressful events experienced (M = 410.44, SD = 182.19). Further, scores on the DERS-Impulse (M = 11.77, SD = 5.10) and DTS (M = 48.66, SD = 12.50) were consistent with other studies using these measures with college-age participants (respectively, Gratz & Roemer, 2004; Anestis, Selby, Fink, & Joiner, 2007). The sample, on average, did not report a hazardous level of drinking, and reported very little illicit drug use outside of NMUPD.

Test of Study Hypotheses

Zero-order Correlations and Group Differences. See Table 1 for zero-order correlations and descriptive statistics among primary variables. The first hypothesis was not supported, such that NMUPD was not significantly associated with any of the transdiagnostic

variables (all p's > .05). As expected, the transdiagnostic variables were significantly associated with one another (all p's < .001), and NMUPD was associated with both alcohol use (r_{pb} = .401, p, < .001) and illicit drug use (r_{pb} = .373, p, < .001). Consistent with previous studies, self-reported and behaviorally measured distress tolerance were not significantly correlated with one another (r = .060, p > .05). Contrary to the second hypothesis, none of the transdiagnostic variables were significantly different between the drug and non-drug use groups, nor were occurrence of stressful events (see Table 2).

Diversity of drug type was significantly different between the two groups, such that individuals who engaged in past year NMUPD reported more diversity of drug use (M = 2.14, SD = 1.67), including illicit drugs and alcohol, than individuals who reported medical or no use (M = 0.71, SD = 0.97). Additionally, there was a significant difference between individuals who abused prescription drugs and those who did not in alcohol use and polysubstance use behaviors. Specifically, those engaging in NMUPD reported more alcohol (M = 4.17, SD = 3.55) and polysubstance use (M = 0.41, SD = 0.50) than the non-drug use group (M_{alc} = 1.57, SD_{alc} = 2.44; M_{poly} = 0.04, SD_{poly} = 0.21; see Table 2). Lastly, self-medication motives for prescription drug use was significantly associated with NMUPD frequency (ρ = .252, p = .037), and was significantly higher than a large sample of undergraduate students who reported lifetime prescription drug use, (t (68) = 12.89, 95% CI [6.04 – 8.26], p < .001). Specifically, the current sample reported a mean of 9.02 (SD = 4.61) compared to the validation mean of 1.86 (SD = 1.05).

Multiple Parallel Mediation. Regarding the third hypothesis, the first parallel mediation model analyses revealed that the a^1, b^1, and c^1 paths were significant (see Figure 2 for the results of each path of the first model). However, the indirect paths from anxiety to NMUPD through

anxiety sensitivity (b = -0.0184, SE = 0.0362, 95% CI [-0.0893 – 0.0525]), distress tolerance (b = -0.0086, SE = 0.0162, 95% CI [-0.0403 – 0.0230]), and emotion-driven impulse control difficulties (b = 0.0302, SE = 0.0403, 95% CI [-0.0487 – 0.1091]) were not significant, indicating no evidence of mediation. Similarly, the second model examining behavioral distress tolerance indicated significant b^1 and c^1 paths, but a nonsignificant a^1 path (see Figure 3 for the result of each path of the second model). Further, the model yielded a nonsignificant indirect effect from anxiety to NMUPD through anxiety sensitivity (b = -0.0158, SE = 0.0346, 95% CI [-0.0835 – 0.0520]), distress tolerance (b = -0.0006, SE = 0.0020, 95% CI [-0.0045 – 0.0034]), and emotion-driven impulse control difficulties (b = 0.0497, SE = 0.0373, 95% CI [-0.0234 – 0.1228]), indicating no evidence of mediation.[1]

[1] Single mediation models examining each mediator variable independently were also examined and yielded the same pattern of null findings.

DISCUSSION

Rates of nonmedical use of prescription drugs (NMUPD) have increased across all age groups, but are especially high among young adults (Blanco et al., 2007). As such, the current study aimed to further the understanding of NMUPD in college students by examining risk factors that are known to contribute to both substance use and anxiety. The findings bring to light the seriousness of the nonmedical use of prescription drugs, and particularly, the high frequency in which it occurs in college students as well as concurrent use with other substances. In this sample, nearly 40% reported past-year NMUPD, which is considerably higher than national averages (15%; SAMHSA, 2015). Although it is possible that the rate of NMUPD in this sample is uncharacteristically high due to the targeted recruitment of individuals who reported use of prescription drugs, this finding is not unprecedented as another study found that the rate of NMUPD among undergraduates in the past three months was 48% (Holloway & Bennett, 2012).

Consistent with literature (e.g., Huang et al., 2006), the most frequently endorsed class of prescription drug was stimulants, which was about twice as high as the next most frequent class, opioids, with sedatives being the least commonly used medication. The majority of participants who engaged in NMUPD did so by using medications that were not prescribed to them, while a smaller portion misused their own prescription medication. Similarly, prior work found that approximately one-third of university students have reported using prescription drugs that are not their own, while 23% reported misusing their own prescription and 11% sold, traded, or gave away their prescribed medication (Holloway & Bennett, 2012). Of students who reported NMUPD in the current sample, 40% endorsed simultaneous polysubstance use.

This rate closely reflects large samples of undergraduates who used prescription drugs and alcohol simultaneously (56.8%; McCabe, Cranford, Morales, & Young, 2006).

In the current study, point-biserial correlations were examined among past-year NMUPD and relevant transdiagnostic vulnerability factors (i.e., anxiety sensitivity, distress tolerance, emotion-driven impulse control difficulties). Contrary to our first hypothesis, these transdiagnostic variables were not significantly associated with NMUPD. However, past-year use of NMUPD was associated with all substance use variables, including alcohol use and use of illicit drugs. Interestingly, counter to prior work, alcohol and illicit drug use were similarly not correlated with the transdiagnostic variables (Simons & Gaher, 2005; Simons, Gaher, Correia, Hansen, & Christopher, 2005).

The second hypothesis examined differences among individuals who reported past-year NMUPD and those who reported medical use or no use. Specifically, we examined group differences among trait anxiety, anxiety sensitivity, distress tolerance, and emotion-driven impulse control difficulties, as well as the presence of stressful events, diversity of substance use, and how NMUPD relates to self-medication motives. Contrary to the hypothesis, there were no significant differences between individuals who engaged in past-year NMUPD and those who did not on anxiety, the three transdiagnostic vulnerabilities, or occurrence of stressful events. However, the finding that alcohol and illicit drug use is more than doubled among prescription drug abusers compared to nonusers is consistent with literature that suggests that likelihood of alcohol and illicit drug use disorders is increased for individuals reporting lifetime NMUPD (Huang et al., 2006). Additionally, correlational findings and mean comparison to a similar sample (Milner, 2015) suggest that students may engage in NMUPD as a self-medication strategy.

Findings suggest that students reporting past-year NMUPD are more likely to engage in heavier alcohol consumption and simultaneous polysubstance use than their abstinent counterparts. Further, over half of students reporting NMUPD also reported simultaneous polysubstance use, most prominently alcohol. Despite the overall low rates of alcohol and illicit drug use in the current study compared to representative samples, the results suggest that NMUPD is associated with substance use generally, and in particular, with higher rates of alcohol, illicit drug, and simultaneous polysubstance use. This high rate and the increased rate of alcohol use in the NMUPD group is particularly alarming given that prescription drugs with sedative qualities (e.g., benzodiazepines, opioid painkillers) augment the depressogenic effects of alcohol, which can to lead to reduced respiratory function or failure and potentially overdose and/or death (White & Irvine, 1999).

Although we would expect anxiety to be on a continuum, trait anxiety lacked variability in the current study, such that the mean level anxiety was very low (see Osman et al., 2012; Table 2), with 63.6% of the sample reporting no anxiety (0 out of possible 21). As such, it is conceivable that prescription drugs, or substances in general, were not used to cope with problematic anxiety, as the sample, on average, did not experience problematic anxiety. Lastly, both prescription drug abusers and nonusers fell within the "severe stress" category regarding occurrence of stressful events, which reflects the literature stating that college is a time of increased stress (Misra & Castillo, 2004; Misra, McKean, West, & Russo, 2000), and could be an explanation as to why there was not a significant difference in occurrence of stressful events. Additionally, this measure rank orders stressful events from most (i.e., death of a close family member) to least stressful (i.e., minor traffic violations). Potentially, students experienced similar

events at roughly equal rates (e.g., “first semester in college,” “problems with a girlfriend or boyfriend”), which may have resulted in scores being equivalent between the two groups.

The third hypothesis tested anxiety sensitivity, distress tolerance (both self-report and behavioral), and emotion-driven impulse control difficulties as parallel mediators of the relation of anxiety and NMUPD. Contrary to expectations, none of the transdiagnostic variables mediated the relationship. However, the sample may be limited in that there is limited variance in the outcome variable, and NMUPD was measured dichotomously rather than continuously. Moreover, it may be difficult for the hypothesized mechanisms (i.e., transdiagnostic vulnerabilities) to account for problematic substance use given the very low level of trait anxiety exhibited in the sample. That is, individuals with normative levels of anxiety would not necessarily engage in the posited negative reinforcement cycle for substance abuse (i.e., NMUPD). Alternatively, it is possible that these constructs simply do not serve as mediators to the relation of anxiety and NMUPD in this sample.

It is unclear why none of the primary study variables or substance use variables were associated with one another, but there are several possible explanations. First, this may indicate that the current sample of college students is atypical compared to those reported in extant literature in regard to substance use rates. Indeed, alcohol use in this sample was markedly lower than the national average for college students (9.2% in the current sample compared to 31.6%; Knight et al., 2002). Similarly, the rate of past-year marijuana use among college students in a large, representative survey was higher than in the current study (30% compared to 16.5%, respectively; Mohler-Kuo, Lee, & Wechsler, 2003). Considering that this sample is, on average, on the low end of emerging adulthood, it is possible that they may behave more like high school students than college students. However, a sample of high school students who reported drinking

alcohol in the past 30 days evidenced higher rates (44.9%; Miller, Naimi, Brewer, & Jones, 2007) than in the current sample of college students. Alternatively, the setting of the current study, which ran up to 10 participants at a given time, may have contributed to potential sample bias due to perceived lack of anonymity.

Limitations

Within the current study, several limitations warrant consideration. A potential chief limitation is the way in which NMUPD was operationally defined as it may have limited generalizability of the results to the overall population of undergraduate students who engage in NMUPD. In the current study, a broad definition of NMUPD was used to capture all behaviors that are associated with misuse of prescription drugs and is consistent with definitions provided by both NIDA and SAMHSA. Specifically, NMUPD was defined as using prescription medication "from a source other than your own prescription, beyond the amount you were told to take, or for some reason other than prescribed," and examples were provided to orient participants (i.e., "some of the common ways include taking stimulants to stay up at night, taking Xanax to feel good, or taking a leftover pain pill for an ache that it was not specifically prescribed for"). This definition is consistent with literature that describes misuse of medication that was prescribed to the individual, using medication from any source other than a provider, and using for a nonmedical or recreational purpose (see Holloway & Bennett, 2012; Kelly et al., 2015). In contrast, other studies simply defined NMUPD as use of a prescribed medication without a doctor's prescription or medication that was not prescribed to them (Jeffers et al., 2015; McCabe et al., 2005). Rates of past-year misuse are much lower in studies using this definition (e.g., less than 30%; Jeffers et al., 2015).

Although the measure used in this study, the Use of Prescription Drugs Questionnaire, was based on existing definitions and research, it is not validated, and the items may have been unclear to some participants. For instance, participants may have misunderstood items such as frequency of prescription drug use, which was designed to be responded to only for participants who engaged in past-year NMUPD. It may be that some participants responded to this item regardless of nonmedical use, which might explain why the frequency of daily NMUPD is so high (e.g., participants who are prescribed amphetamines for attention difficulties would take them daily). Given this limitation, this measure may lack internal validity as participants may have inconsistently responded to items on this questionnaire, which consequently limited variability among items. As such, these results may not extend to the broader population of students engaging in NMUPD.

A related limitation concerns the characteristics of the individuals reporting NMUPD. Alcohol use rates were lower in the current study than observed in previous studies of college students and high schoolers; therefore, the correlational and descriptive findings suggest that the sample characteristics in regard to substance use may not generalize to other college-age samples. Relatedly, the perceived anonymity in the current study may have been an issue in the reporting of illegal activity (e.g., NMUPD, underage drinking). However, this could also point to the complexity of prescription drug use and abuse, especially considering that the drug use group was quite heterogeneous. For example, there was considerable variability in frequency of NMUPD, with 29.0% of the drug use group reporting past-year NMUPD on only one occasion, 27.5% reporting monthly, and 7.2% reporting weekly. There is reason to believe that an individual abusing prescription drugs once in the past year would be characteristically different regarding anxiety and substance use than someone reporting weekly NMUPD. Additionally, the

current study did not examine different classes of prescription drug abuse, but instead examined NMUPD overall. There could be important distinctions among individuals who use stimulants, sedatives, opioids, or a combination of the three classes. Cumulatively, these findings suggest the importance of examining NMUPD functionally.

An additional limitation is that the sample may lack heterogeneity regarding sociodemographic variables, specifically that the sample is mostly freshmen (71.2%), female (75.5%), and White (71.7%). As NMUPD has been associated with older students and males (McCabe et al., 2005), the sample may limit the generalizability of current findings. However, the extant literature is mixed concerning sex as a risk factor (e.g., Young et al., 2012), as some studies have found that the likelihood of NMUPD has been shown to be higher in men (Huang et al., 2006; Lanier & Farley, 2011), others among women (Simoni-Wastila, 2000), and some finding no significant difference between the sexes (Simoni-Wastila, Ritter, & Strickler, 2004). Lastly, the study sample was collected from a large, southeastern public institution located in a rural area; however, NMUPD may differ in other regions of the country or urban areas. Indeed, McCabe and colleagues (2005) report that universities in the northeastern region of the United States and those that have competitive admission criteria encounter higher rates of past-year and past-month nonmedical stimulant use than other regions of the country and less competitive admission criteria, respectively.

In addition to the aforementioned methodological and sample characteristic issues, the primary study variables (i.e., NMUPD and transdiagnostic variables), with the exception of the MTPT-C, were retrospective self-reports. Further, the overall low rate of trait anxiety observed in this study and the poor reliability evidenced by the ASI-3 are limitations of the methodology that should be examined in future work. Lastly, given the sensitive nature of illegal drug use, it

may be possible that students were dishonest in reporting their drug use. To address this concern, participant materials were kept in folders that were marked as "confidential" and were told that their results would be entirely anonymous.

Future Directions and Conclusions. Overall, the results of the current study contribute to the growing body of literature supporting the adverse outcomes associated with prescription drug abuse, and underscore the need for future studies to hypothesize intervention efforts to address these alarming findings. Such efforts should include a thorough screener for polysubstance use among college students given the high rates of substance abuse in this population. Specifically, it may be beneficial to administer screeners to students who report any substance use, as rates of NMUPD in the current study and extant literature are higher among students engaging in other substance use. In particular, simultaneous polysubstance use was higher among students engaging in past-year NMUPD, suggesting this population may be at increased risk for risky substance use behaviors compared to students who do not abuse prescription drugs.

Regarding future research endeavors, the null findings and methodological limitations of the current study highlight key areas for consideration in future studies. An important next direction would be examining the role of the transdiagnostic factors as mechanisms in the relation of anxiety and NMUPD in an anxious sample. Certainly, results would be strengthened if anxiety and NMUPD were assessed via clinical interview to determine whether symptoms reach clinical significance, or other non-retrospective method such as ecological momentary assessment to measure substance use behaviors and emotional experiences presently. Additional studies should consider use of such methodology for making inferences to individuals with anxiety symptoms that reach clinical significance, and to better assess NMUPD severity and

impairment. If using self-report, future studies would benefit from a validated measure of NMUPD that is not exclusive to one class of prescribed medication, and should consider rates in the context of the definition of NMUPD that is being used. In addition, independent examination of various classes of prescription drugs is warranted in order to identify unique characteristics associated with a particular class of prescribed medication. Given the sensitive nature of illegal prescription drug use, future studies would benefit from increasing the appearance of anonymity, potentially by placing screen dividers between participants. Lastly, use of a larger, longitudinal sample is warranted to determine temporal and causal conclusions regarding anxiety and NMUPD.

The current study expands on the extant literature regarding correlates of past-year NMUPD in college students, an at risk population. As rates of NMUPD are increasing among college students, it is important to understand risk factors and risky behavior that are associated with prescription drug abuse. Although the results of the current study do not indicate that anxiety is a risk factor for past-year NMUPD in college students, they do suggest that prescription drug abusers engage in higher rates of risky behavior including other substance abuse and simultaneous polysubstance use. As such, future studies are called upon to further examine the risk factors and associated risky behaviors associated with NMUPD among college students.

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LIST OF APPENDICES

APPENDIX A: THE ALCOHOL USE DISORDERS IDENTIFICATION TEST

Select the appropriate answer.

1. How often do you have a drink containing alcohol?
   (0) Never (Skip to Questions 9-10)
   (1) Monthly or less
   (2) 2 to 4 times a month
   (3) 2 to 3 times a week
   (4) 4 or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?
   (0) 1 or 2
   (1) 3 or 4
   (2) 5 or 6
   (3) 7, 8, or 9
   (4) 10 or more

3. How often do you have six or more drinks on one occasion?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

4. How often during the last year have you found that you were not able to stop drinking once you had started?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

5. How often during the last year have you failed to do what was normally expected from you because of drinking?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

6. How often during the last year have you been unable to remember what happened the night before because you had been drinking?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

7. How often during the last year have you needed an alcoholic drink first thing in the morning to get yourself going after a night of heavy drinking?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

8. How often during the last year have you had a feeling of guilt or remorse after drinking?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?
   (0) No
   (2) Yes, but not in the last year
   (4) Yes, during the last year

10. Has a relative, friend, doctor, or another health professional expressed concern about your drinking or suggested you cut down?
    (0) No
    (2) Yes, but not in the last year

    (4) Yes, during the last year

APPENDIX B: ANXIETY SENSITIVITY INDEX – 3

Please circle the number that best corresponds to how much you agree with each item. If any items concern something that you have never experienced (e.g., fainting in public) answer on the basis of how you think you might feel *if you had* such an experience. Otherwise, answer all items on the basis of your own experience. Be careful to circle only one number for each item and please answer all items.

	Very little	**A little**	**Some**	**Much**	**Very much**
1. It is important for me not to appear nervous.	0	1	2	3	4
2. When I cannot keep my mind on a task, I worry that I might be going crazy.	0	1	2	3	4
3. It scares me when my heart beats rapidly.	0	1	2	3	4
4. When my stomach is upset, I worry that I might be seriously ill.	0	1	2	3	4
5. It scares me when I am unable to keep my mind on a task.	0	1	2	3	4
6. When I tremble in the presence of others, I fear what people might think of me.	0	1	2	3	4
7. When my chest feels tight, I get scared that I won't be able to breathe properly.	0	1	2	3	4
8. When I feel pain in my chest, I worry that I am going to have a heart attack.	0	1	2	3	4
9. I worry that other people will notice my anxiety.	0	1	2	3	4
10. When I feel "spacey" or spaced out I worry that I may be mentally ill.	0	1	2	3	4
11. It scares me when I blush in front of people.	0	1	2	3	4
12. When I notice my heart skipping a beat, I worry that there is something seriously wrong with me.	0	1	2	3.	4
13. When I begin to sweat in a social situation, I fear people will think negatively of me.	0	1	2	3	4
14. When my thoughts seem to speed up, I worry that I might be going crazy.	0	1	2	3	4
15. When my throat feels tight, I worry that I could choke to death.	0	1	2	3	4
16. When I have trouble thinking clearly, I worry that there is something wrong with me.	0	1	2	3	4
17. I think it would be horrible for me to faint in public.	0	1	2	3	4
18. When my mind goes blank, I worry there is something terribly wrong with me.	0	1	2	3	4

APPENDIX C: COLLEGE STUDENT'S STRESSFUL EVENT CHECKLIST

Rank:	Value:	Happened:	Score:	Life Event:
1	100			Death of a close family member
2	73			Death of a close friend
3	65			Divorce between parents
4	63			Serious legal problems
5	63			Major personal injury or illness
6	58			Responsibilities for others, such as children/spouse
7	50			Threat to major source of income
8	47			Difficulty with roommate(s)
9	45			Change in health of a family member
10	45			Pregnancy
11	44			Sexual problems
12	40			Serious disagreements with parents
13	39			Change in lifestyle for financial reasons
14	39			Difficulty in identifying a major
15	39			Serious argument with close family member
16	39			Problems with a girlfriend or boyfriend
17	37			Having to repeat a course
18	37			Increased workload at school
19	36			Outstanding personal achievement
20	35			First semester in college
21	31			Change in living conditions
22	30			Serious disagreements with an instructor
23	29			Lower grades than expected
24	29			Change in sleeping habits
25	29			Change in social habits
26	28			Change in eating habits
27	26			Chronic car problems
28	26			Change in number of family get togethers
29	25			Too many missed classes
30	24			Change in plans for a major
31	23			Dropped more than one class
32	20			Minor traffic violations

APPENDIX D: DEPRESSION ANXIETY STRESS SCALE – 21 – ANXIETY

INSTRUCTIONS: Please read each statement and choose the number which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement. The rating scale is as follows:

0 = Did not apply to me at all
1 = Applied to me some degree, or some of the time
2 = Applied to me a considerable degree, or a good part of the time
3 = Applied to me very much, or most of the time

	Did not apply to me	Applied to me some degree, or some of the time	Applied to me a considerable degree, or a good part of the time	Applied to me very much, or most of the time
1. I was aware of dryness in my mouth.	0	1	2	3
2. I experience breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).	0	1	2	3
3. I experienced trembling (e.g., in the hands).	0	1	2	3
4. I was worried about situations in which I might panic and make a fool of myself.	0	1	2	3
5. I felt I was close to panic.	0	1	2	3
6. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).	0	1	2	3
7. I felt scared without any good reason.	0	1	2	3

APPENDIX E: DIFFICULTIES IN EMOTION REGULATION SCALE – IMPULSE

Please indicate how often the following statements apply to you by filling in the appropriate numbered bubble from the scale below:
1=almost never (0-10%); 2=sometimes (11-35%); 3=about half the time (36-65%); 4=most of the time (66-90%); 5=almost always (91-100%).

	Almost never	Sometimes	About half the time	Most of the time	Almost always
1. I experience my emotions as overwhelming and out of control.	1	2	3	4	5
2. When I'm upset, I become out of control.	1	2	3	4	5
3. When I'm upset, I feel out of control.	1	2	3	4	5
4. When I'm upset, I feel like I can remain in control of my behaviors.	1	2	3	4	5
5. When I'm upset, I have difficulty controlling my behaviors.	1	2	3	4	5
6. When I'm upset, I lose control over my behaviors.	1	2	3	4	5

APPENDIX F: DISTRESS TOLERANCE SCALE

Directions: Think of times that you feel distress or upset. Select the item that best describes your beliefs about feeling distressed or upset.

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

APPENDIX G: MARLOWE-CROWNE SOCIAL DESIRABILITY SCALE – SHORT FORM

Instructions: Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you.

1. It is sometimes hard for me to go on with my work if I am not encouraged.	True	False
2. I sometimes feel resentful when I don't get my own way.	True	False
3. On a few occasions, I have given up doing something because I thought too little of my ability.	True	False
4. There have been times when I felt like rebelling against people in authority even though I knew they were right.	True	False
5. No matter who I'm talking to, I'm always a good listener.	True	False
6. There have been occasions when I took advantage of someone.	True	False
7. I'm always willing to admit it when I make a mistake.	True	False
8. I sometimes try to get even, rather than forgive and forget.	True	False
9. I am always courteous, even to people who are disagreeable.	True	False
10. I have never been irked when people expressed ideas very different from my own.	True	False
11. There have been times when I was quite jealous of the good fortune of others.	True	False
12. I am sometimes irritated by people who ask favors of me.	True	False
13. I have never deliberately said something that hurt someone's feelings.	True	False

APPENDIX H: NONMEDICAL PRESCRIPTION DRUG MOTIVES QUESTIONNAIRE

Below is a list of reasons people sometimes give for nonmedical prescription drug use. Think about all of the times that you have used prescription drugs nonmedically and indicate how often you have done so for each of the below reasons.

	Almost Never/Never	**Some of the Time**	**Half of the Time**	**Most of the Time**	**Almost Always/ Always**
1. Because your friends pressure you to use them	1	2	3	4	5
2. Because it helps you when you feel depressed or nervous	1	2	3	4	5
3. To be sociable	1	2	3	4	5
4. So that others won't kid you about not doing it	1	2	3	4	5
5. To get high	1	2	3	4	5
6. Because it gives you a pleasant feeling	1	2	3	4	5
7. Because it improves parties and celebrations	1	2	3	4	5
8. To forget about your problems	1	2	3	4	5
9. Because it's fun	1	2	3	4	5
10. To be liked	1	2	3	4	5
11. To manage pain	1	2	3	4	5
12. To be more efficient	1	2	3	4	5
13. To escape from your life	1	2	3	4	5
14. To help you stay organized	1	2	3	4	5
15. To perform better on school work or on tests	1	2	3	4	5
16. Because it helps to increase your alertness	1	2	3	4	5
17. To help you sleep	1	2	3	4	5

18. To help focus	1	2	3	4	5
19. Because you didn't want to be the only one not doing it	1	2	3	4	5
20. Because it counteracts the effects of other drugs	1	2	3	4	5

APPENDIX I: USE OF PRESCRIPTION DRUGS QUESTIONNAIRE

Doctors sometimes prescribe medicine to calm people down or to help them relax their muscles, to help people sleep, deal with pain, or lose weight. Besides the medical uses, people sometimes take these pills on their own without the direction of a doctor or recreationally. This is sometimes called "nonmedically," which means from a source other than your own prescription, beyond the amount you were told to take, or some reason other than prescribed. For instance, some of the common nonmedical or recreational uses include taking stimulants to stay up at night, taking Xanax to feel good, or taking a leftover pain pill for an ache that it was not specifically prescribed for.

Instructions: Please answer the following questions pertaining to **past year** prescription drug use.

1. Check the boxes of any medication(s) you use, either prescribed or non-prescribed.

- ☐ Stimulants (e.g., amphetamines: *Adderall* [speed]; *Ritalin* [Vitamin R], *Vyvanse*, "bennies," "uppers")
  - o Type (if known): _____
- ☐ Sedatives (e.g., anxiolytics: *Ativan, Klonopin*, *Valium*, *Xanax* [bars], "barbs," "benzos," "downers," "tranks;" sleeping pills: *Ambien*
  - o Type (if known): _____
- ☐ Opioid painkillers (e.g., *Codeine* [cody, Purple Drank], *Hydrocodone*/*Lortab*/*Vicodin* [hydro, norco, tabs, vike], *Oxycodone/OxyContin*/*Percocet* [oxy, percs])
  - o Type: (if known): _____
- ☐ Other _____

2. Have you used prescription stimulants, sedatives, opioid painkillers, or any other prescription medications that were <u>not prescribed to you</u>? **YES NO**

3. Have you used prescription stimulants, sedatives, opioid painkillers, or any other prescription medications <u>beyond the amount you were told to take</u> (either in a day or in one dose)? **YES NO**

4. Have you used prescription stimulants, sedatives, opioid painkillers, or any other prescription medications for <u>reasons other than prescribed</u>? **YES NO**

5. If yes to any of the above, what medication(s)?

_____

5a. In what circumstances do you use *stimulants*?

- ☐ Social (e.g., partying or pregaming, enhancement of good mood)
- ☐ Academic (e.g., to stay up later, enhance studying)

☐ Coping (e.g., to relieve stress or anxiety, reduce bad mood)
☐ Other

_____

☐ None

5b. In what circumstances do you use *sedatives*?

☐ Social (e.g., partying or pregaming, enhancement of good mood)
☐ Academic (e.g., to stay up later, enhance studying)
☐ Coping (e.g., to relieve stress or anxiety, reduce bad mood)
☐ Other

_____

☐ None

5c. In what circumstances do you use *opioid painkillers*?

☐ Social (e.g., partying or pregaming, enhancement of good mood)
☐ Academic (e.g., to stay up later, enhance studying)
☐ Coping (e.g., to relieve stress or anxiety, reduce bad mood)
☐ Other

_____

☐ None

6. In the past 12 months, how much have you used prescription medications recreationally or nonmedically?

0	1	2	3	4	5	6	Other:
Never	Once	Monthly	Weekly	2-3 days per week	Daily	Multiple times a day	

Dose can mean both the dosage prescribed (i.e., the amount in milligrams) and the frequency taken (i.e., amount of times used per day, week, etc.). Refer to the medication information sheet for standard dosages.

7. When you are using prescription drugs, how much, on average, do you take?

1	2	3	4	5	6
Less than ½ the prescribed dosage	½ of the prescribed dosage	Prescribed dosage	1.5 times the prescribed dosage	Twice the prescribed dosage	More than twice the prescribed dosage

8. Do you ever use prescription drugs simultaneously with any other substance including alcohol, marijuana, other prescription drugs, or any other illicit drugs?

YES NO

8a. If so, which substance(s)?

_____

9. Over the past year, has your use of prescription drugs been associated with feeling a strong desire or urge to use? **YES NO**

APPENDIX J: SOCIODEMOGRAPHIC QUESTIONNAIRE AND GENERAL MEDICAL HISTORY

1. Sex
    a. Male
    b. Female
    c. Transgender

2. Age _____

3. Date of birth _____

4. Ethnicity
    a. Not Hispanic or Latino
    b. Hispanic or Latino

5. Race
    a. White
    b. Black or African American
    c. Asian
    d. Native Hawaiian or Other Pacific Islander
    e. Native American/Alaska Native
    f. Biracial
    g. Other: _____

6. Year in school
    a. Freshman (1st year)
    b. Sophomore (2nd year)
    c. Junior (3rd year)
    d. Senior (4th year)
    e. Other: _____

7. Current GPA: _____

8. Number of courses enrolled in this semester: _____

9. Major: _____

10. Living Status
    a. On-campus dorm
    b. Greek-affiliated house
    c. Off-campus apartment or house
    d. Other: _____

11. Do you live:
    a. With friends
    b. With family

c. By yourself

12. Indicate which of the following applies to you:
    a. I have the University of Mississippi's student health insurance.
    b. I have health insurance through the state's Children's Health Insurance Program (CHIP).
    c. I am on my parents' or another guardian's health insurance.
    d. I do not have health insurance.

13. Please indicate how many days you have used each of the following substances in the **past year**. Also, please indicate if you have **EVER** used the substance in your lifetime (SELECT THE APPROPRIATE BOX FOR EACH QUESTION.)

	How often did you use this substance in the **PAST YEAR**?					Have you **EVER** used this substance in your lifetime?	
	Never	**Less than monthly**	**Monthly**	**Weekly**	**Daily/Almost daily**	**Yes**	**No**
a. **Alcohol**	1	2	3	4	5	1	2
b. **Caffeine**	1	2	3	4	5	1	2
c. **Cigarettes or other tobacco**	1	2	3	4	5	1	2
d. **Marijuana** (pot, weed)**, hashish** (hash)	1	2	3	4	5	1	2
e. **Cocaine** (crack, coke, rock)	1	2	3	4	5	1	2
f. **Heroin**	1	2	3	4	5	1	2
g. **Methamphetamine** (crank, ice, meth)	1	2	3	4	5	1	2
h. **Hallucinogens** (LSD, mescaline, peyote, mushrooms, psilocybin, etc.)	1	2	3	4	5	1	2
i. **PCP** (angel dust) or **Ketamine** ("K")	1	2	3	4	5	1	2
j. **Ecstasy** (X), **GHB** (Liquid X), or **Rohypnol** (roofie)	1	2	3	4	5	1	2

1. Do you have or have you ever had any of the following medical conditions?

				Current?	Approximate Date of Diagnosis
a.	Heart Attack	yes	no	_____	_____
b.	Angina (chest pain on exertion)	yes	no	_____	_____
c.	Irregular Heart Beat	yes	no	_____	_____
d.	Other Heart Problems	yes	no	_____	_____
e.	Stroke	yes	no	_____	_____
f.	Dizziness/Fainting Spells	yes	no	_____	_____
g.	High Blood Pressure	yes	no	_____	_____
h.	High Cholesterol	yes	no	_____	_____
i.	Thyroid Problems	yes	no	_____	_____
j.	Cancer	yes	no	_____	_____
k.	Kidney Problems	yes	no	_____	_____
l.	Liver Problems	yes	no	_____	_____
m.	Gout	yes	no	_____	_____
n.	Diabetes	yes	no	_____	_____
o.	Emotional/Psychiatric Problems	yes	no	_____	_____
p.	Drug/Alcohol Problems	yes	no	_____	_____
q.	Arthritis	yes	no	_____	_____
r.	Emphysema	yes	no	_____	_____
s.	Seizure Disorder	yes	no	_____	_____
t.	Head injury with loss of consciousness	yes	no	_____	_____
u.	Cognitive impairment	yes	no	_____	_____
v.	Respiratory or Lung Problem (e.g., Asthma, Bronchitis)	yes	no	_____	_____
w.	Immune disorder	yes	no	_____	_____

2. If you answered ″yes″ to any of the above medical conditions, please describe:

Problem: _____
Treatment Received: _____

Problem: _____
Treatment Received: _____

Problem: _____
Treatment Received: _____

3. Do you have a personal physician? **YES NO**
If yes, when was your last visit? _____

4. Do you have a personal psychiatrist? **YES NO**
If yes, when was your last visit? _____

5. Have you ever been in therapy? **YES NO**

5a. If yes, what was the therapy for (e.g., stress, depression, anxiety, anger)?

_____

5b. Are you currently in therapy? **YES NO**

5c. If no, when were you in therapy?

_____

6. Please list **all** medications that you are currently taking on a regular basis:

MEDICATION	REASON FOR TAKING
_____	_____
_____	_____
_____	_____
_____	_____

7. Have you **ever** taken any medication for mood?

YES NO

If yes, please list which medication(s):

Medication:_____ Dose: _____
Medication:_____ Dose: _____
Medication:_____ Dose: _____
Medication:_____ Dose: _____

8. Do you or have you had a prescription for stimulants, sedatives, or opioid painkillers?

YES NO

If yes,

What *stimulant*? _____ Dose: _____
What *sedative*? _____ Dose: _____
What *opioid painkiller*? _____ Dose: _____

8a. Do you have a current (or have you in the past year) prescription? **YES NO**

8b. What were the doctor's instructions?

_____
_____
_____

8c. Do you take the medication as prescribed (e.g., dose, frequency)? **YES NO**

8d. How do you use the medication?

_____
_____
_____

9. Please list any herbal or over-the-counter medications that you take regularly:

_____

_____

10. Please list any operations/surgeries that you have had:

Procedure:_____ Date:_____
Procedure:_____ Date:_____
Procedure:_____ Date:_____

11. Is there anything else about your health status that you think might be important or useful to tell us? **YES NO**

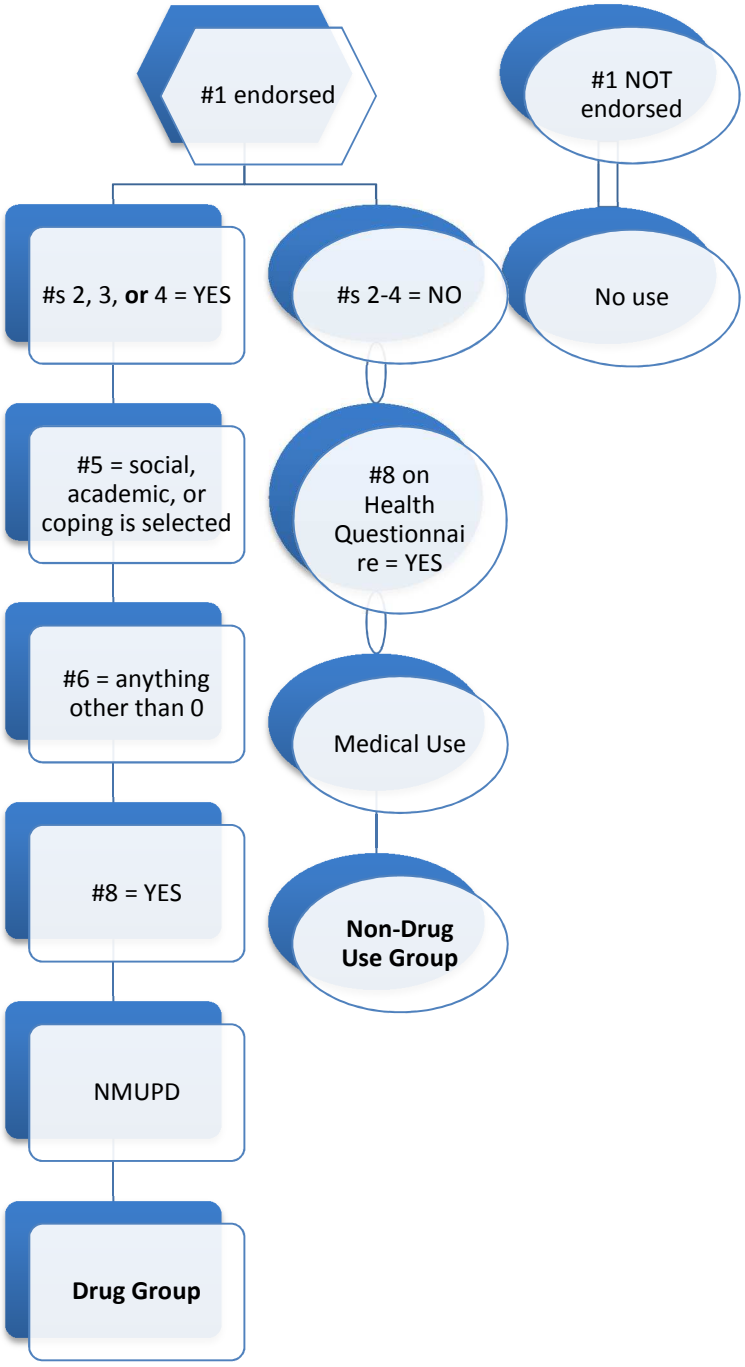
If yes, please explain:

_____

_____

_____

APPENDIX K: GROUP ASSIGNMENT FORM


#1 endorsed
#1 NOT endorsed
#s 2, 3, or 4 = YES
#s 2-4 = NO
No use
#5 = social, academic, or coping is selected
#8 on Health Questionnaire = YES
#6 = anything other than 0
Medical Use
#8 = YES
Non-Drug Use Group
NMUPD
Drug Group

LIST OF TABLES

Table 1. *Point-Biserial Correlations of NMUPD and Study Variables*

	1	2	3	4	5	6	7	8
1. NMUPD	–							
2. ASI-3	.030	–						
3. DASS-21-A	.120	.363***	–					
4. DERS-Impulse	.132	.309***	.559***	–				
5. DTS	-.103	-.465***	-.405***	-.573***	–			
6. Quit latency	-.046	-.004	-.135	-.147*	.060	–		
7. AUDIT	.401***	.058	.094	.061	-.050	-.198**	–	
8. Illicit drug use	.373***	.077	.183*	.096	-.120	-.075	.371***	–
Mean	–	15.97	1.89	11.77	48.66	63.24	2.54	0.33
SD	–	4.90	3.34	5.10	12.50	80.46	3.16	0.86
n	184	184	184	184	184	180	184	168

Note. ASI-3 = Anxiety Sensitivity Index – 3; AUDIT = Alcohol Use Disorders Identification Test; DASS-21-A = Depression Anxiety Stress Scale – 21 – Anxiety subscale; DERS-Impulse = Difficulties in Emotion Regulation Scale – Impulse subscale; DTS = Distress Tolerance Scale; NMUPD = nonmedical use of prescription drugs; Quit latency = quit latency of Mirror Tracing Persistence Task in seconds.

*$p < .05$, **$p < .01$, ***$p < .001$

Table 2. *Between Group Differences on Study Variables*

	NMUPD			Non-NMUPD							
	M	*SD*	*n*	*M*	*SD*	*n*	*d*	95% CI for Mean Difference	*t*	*p*	*df*
ASI-3	16.16	4.51	69	15.86	5.14	115	0.06	[-1.78 – 1.18]	-0.399	.690	182
DASS-21-Anxiety	2.41	3.81	69	1.58	2.99	115	0.24	[-1.77 – 1.18]	-1.533	.128	118
DERS-Impulse	12.64	5.71	69	11.25	4.65	115	0.27	[-2.91 – 0.14]	-1.793	.075	182
DTS	47.00	13.10	69	49.66	12.07	115	0.21	[-1.09 – 6.41]	1.402	.163	182
Quit latency	58.46	72.28	68	66.14	85.23	112	0.10	[-16.77 – 32.13]	0.620	.536	178
CSSEC	405.04	181.39	69	415.83	182.98	115	0.06	[-44.02 – 65.58]	0.388	.698	182
Diversity of drug use	2.14	1.67	64	0.71	0.97	103	1.05	[-1.83 – -1.03]	-7.020	< .001	165
AUDIT	4.17	3.55	69	1.57	2.44	115	0.86	[-3.57 – -1.65]	-5.393	< .001	106.80
Poly-substance use	0.41	0.50	68	0.05	0.21	115	0.97	[-0.49 – -0.24]	-5.838	< .001	80.72

Note. ASI-3 = Anxiety Sensitivity Index – 3; AUDIT = Alcohol Use Disorders Identification Test; CSSEC = College Student Stressful Event Checklist; DASS-21-A = Depression Anxiety Stress Scale – 21 – Anxiety subscale; DERS-Impulse = Difficulties in Emotion Regulation Scale – Impulse subscale; DTS = Distress Tolerance Scale; NMUPD = nonmedical use of prescription drugs; Quit latency = quit latency of Mirror Tracing Persistence Task in seconds. Diversity of drug use includes alcohol and illicit drugs and excludes tobacco and prescription drugs.

LIST OF FIGURES

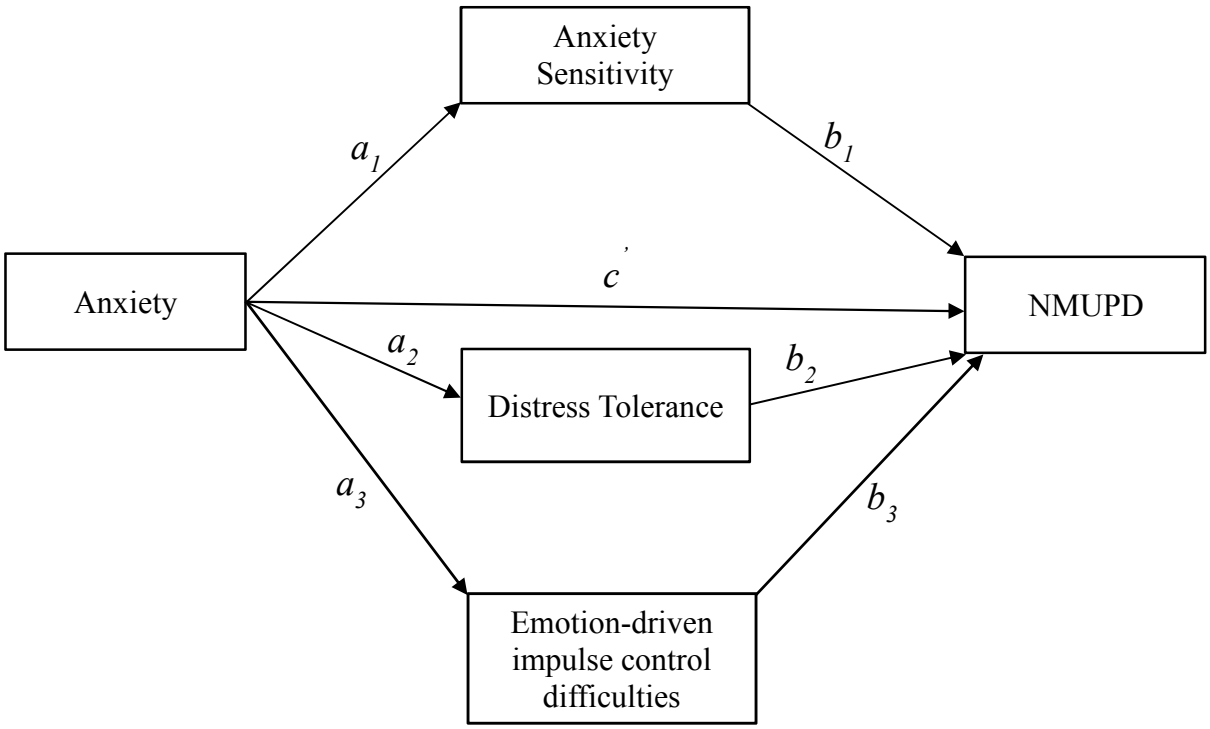


Figure 1. Conceptual diagram of the proposed multiple parallel mediation model

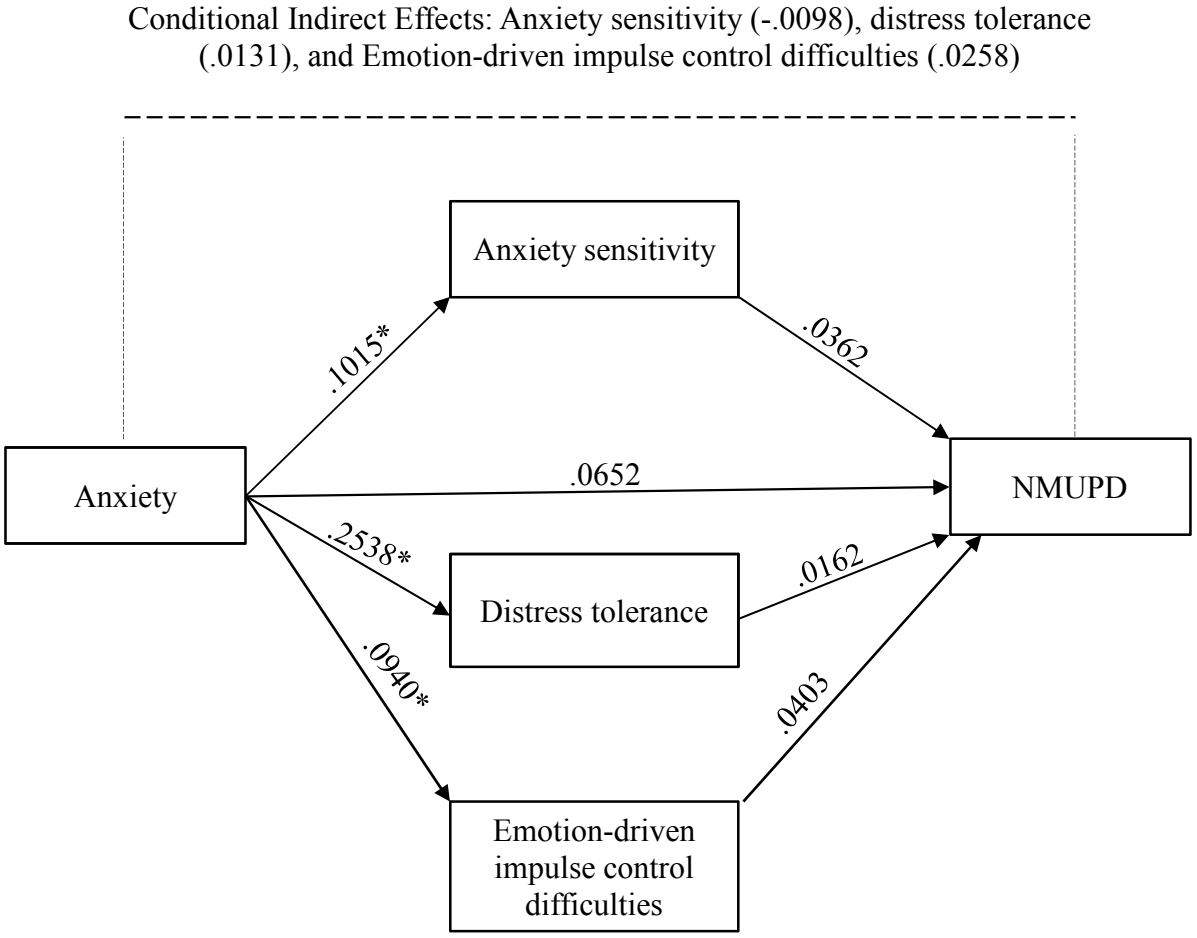


Figure 2. Multiple mediation model of the relation between anxiety and NMUPD, with self-reported anxiety sensitivity, distress tolerance, and emotion-driven impulse control difficulties. *Note*. The unstandardized regression coefficients for each path of the model are reported.
*$p < .001$

Conditional Indirect Effects: Anxiety sensitivity (-.0082), distress tolerance via latency to quit (.0018), and Emotion-driven impulse control difficulties (.0433)

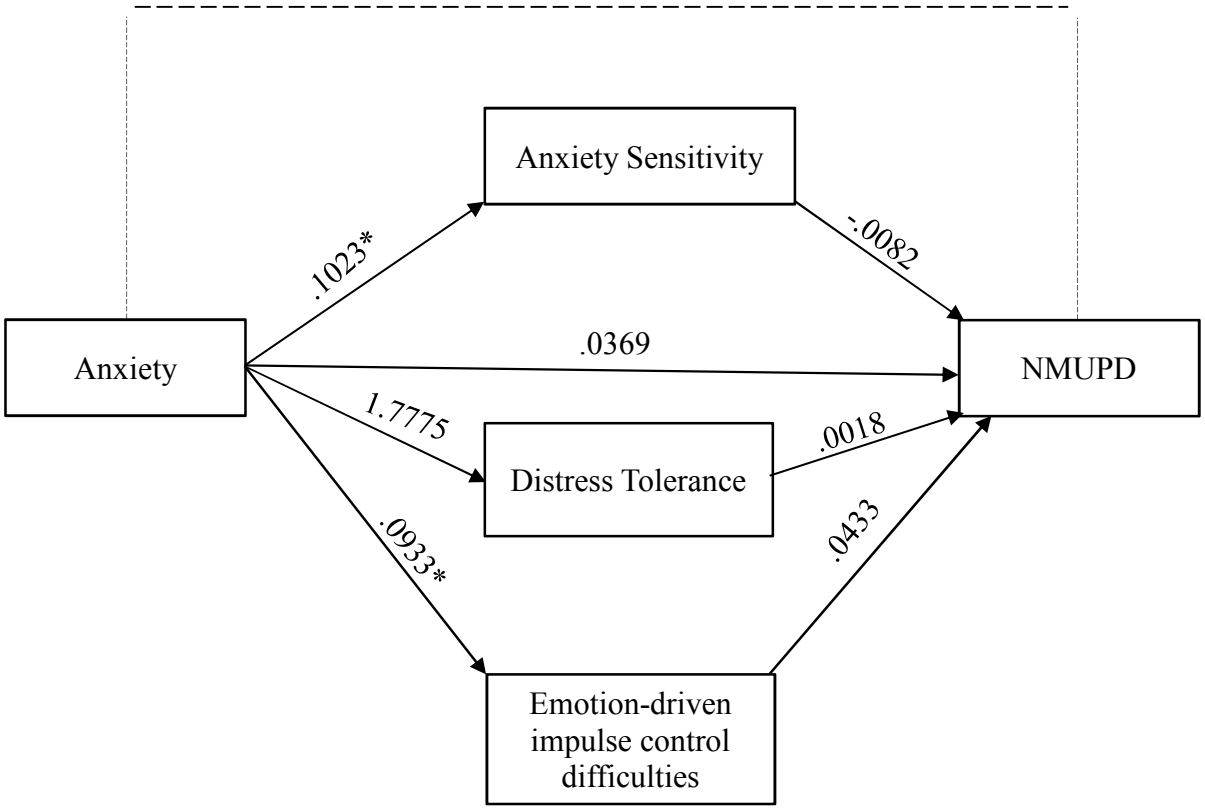


Figure 3. Multiple mediation model of the relation between anxiety and NMUPD, with self-reported anxiety sensitivity and emotion-driven impulse control difficulties, and behaviorally measured distress tolerance.
Note. The unstandardized regression coefficients for each path of the model are reported.
*$p < .001$

VITA

Sara M. Witcraft, B.A.
(Revised September 2018)

PROFESSIONAL ADDRESS

University of Mississippi
Department of Psychology
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EDUCATION

2016– **Doctoral Program, Clinical Psychology (APA-Accredited)**
Department of Psychology, University of Mississippi, Oxford, MS
Defended: Sept. 2018 Thesis Title: *Nonmedical Use of Prescription Drugs among Young Adults: An Examination of Anxiety Sensitivity, Distress Tolerance, and Emotion-Driven Impulse Control Difficulties*
Chair: Laura J. Dixon, Ph.D.

Received: May 2014 **Bachelor of Arts, Psychology, Cum Laude**
Department of Psychology, University of Miami, Coral Gables, FL
Honors Thesis Title: *The Relationship Between Traumatic Life Events and Hoarding Symptoms*
Chair: Kiara R. Timpano, Ph.D.

AWARDS AND HONORS

2018 *Nominated for the Graduate Research Achievement Award*
Department of Psychology, University of Mississippi

2016–2020 *Graduate Honors Fellowship* ($3,000 per year)
University of Mississippi

2014 B.*A. Awarded Cum Laude; Departmental Honors in Psychology*
University of Miami

2014 *First Place, Research Creativity and Innovation Forum*
Social Sciences Division
University of Miami

2013 *Student Travel Scholarship*
University of Miami

Summer 2013 *College of Arts and Sciences Summer Program for Underrepresented Minorities and Women ($2,500) and PRIME Summer Research Program*
University of Miami

2010–2014 *President's Honor Roll, Provost's Honor Roll, and Dean's List*
All semesters, University of Miami

PEER-REVIEWED PUBLICATIONS

7. Asmundson, G. J. G., Thorisdottir, A. S., Roden-Foreman, J. W., Baird, S. O., **Witcraft, S. M.**, Stein, A. T., Smits, J. A. J., & Powers, M. B. (in press). A meta-analytic review of cognitive processing therapy for posttraumatic stress disorder in adults. *Cognitive Behaviour Therapy.* doi: 10.1080/16506073.2018.1522371

6. Dixon, L. J., **Witcraft, S. M.**, & Perry, M. M. (2018). How does anxiety affect adults with skin disease? Examining the indirect effect of anxiety symptoms on impairment through anxiety sensitivity. *Cognitive Therapy and Research.* Advance online publication. doi: 10.1007/s10608-018-9942-5

5. Vrijsen, J. N., Dainer-Best, J., **Witcraft, S. M.**, Papini, S., Hertel, P., Beevers, C. G., Becker, E. S., & Smits, J. A. J. (2018). Effect of Cognitive Bias Modification-Memory on depressive symptoms and autobiographical memory bias: Two independent studies in high-ruminating and dysphoric samples. *Cognition and Emotion*. Advance online publication. doi: 10.1080/02699931.2018.1450225.

4. Carpenter, J. K., Andrews, L. A., **Witcraft, S. M.**, Powers, M. B., Smits, J. A. J., & Hofmann, S. G. (2018). Cognitive behavioral therapy for anxiety and related disorders: A meta-analysis of randomized placebo-controlled trials. *Depression and Anxiety, 35*(6)*,* 502-514. doi: 10.1002/da.22728

3. Dixon, L. J., **Witcraft, S. M.**, McCowan, N. K., & Brodell, R. T. (2018). Stress and skin disease quality of life: The moderating role of anxiety sensitivity social concerns. *British Journal of Dermatology, 178*(4)*,* 951-957. doi: 10.1111/bjd.16082

2. Davis, M.L., **Witcraft, S. M.**, Smits, J. A. J., Dowd, S., Pollack, M., Rosenfield, D., Otto, M., & Hofmann, S. G. (2016). D-Cycloserine augmentation of exposure therapy: Review and new directions. *Quality in Primary Care, 24*(1)*.*

1. Shaw, A. M., **Witcraft, S. M.**, & Timpano, K. R. (2016). The relationship between traumatic life events and hoarding symptoms: A multi-method approach. *Cognitive Behaviour Therapy, 45*(1)*,* 49-59. doi: 10.1080/16506073.2015.1101150

Manuscripts Under Review

2. Tynes, B. L., Mandrell, B. N., Russell, K. M., Hammarback, T., Loew, M. M., **Witcraft, S. M.**, & Crabtree, V. M. (2018). Changes in sleep hygiene and sleep patterns in newly diagnosed pediatric oncology patients. Submitted to *Journal of Pediatric Oncology Nursing*.

1. Carl, E., **Witcraft, S. M.**, Kauffman, B. Y., Gillespie, E. M., Becker, E., Cuijpers, P., Van

Ameringen, M., Smits, J. A. J., & Powers, M. B. (2018). A meta-analysis of psychological and pharmacological treatments for generalized anxiety disorder (GAD). Submitted to *Cognitive Behaviour Therapy*.

BOOK CHAPTERS

2. Dixon, L. J., & **Witcraft, S. M.** (in press). Anxiety and Skin Disease. In L. Cohen (Ed.) *Wiley Encyclopedia of Health Psychology.* Hoboken, NJ: Wiley.

1. Davis, M. L., **Witcraft, S. M.**, Baird, S. O., & Smits, J. A. J. (2017). Learning Principles in CBT. In S. G. Hofmann & G. J. G. Asmundson (Eds.) *The Science of Cognitive Behavioral Therapy, (1st ed.)*. Cambridge, MA: Academic Press.

PROFESSIONAL RESEARCH PRESENTATIONS

16. **Witcraft, S. M.**, Perry, M. M., Boullion, G. Q., & Dixon, L. J. (2018, November). *The moderating role of anxiety sensitivity social concerns in stress and quality of life among adults with skin disease*. Poster accepted to the 52nd Association for Behavioral and Cognitive Therapies Annual Convention, Washington, D.C.

15. Boullion, G. Q., Dixon, L. J., Perry, M. M., & **Witcraft, S. M.** (2018, November). Emotion regulation difficulties and depression among individuals with dermatological and body dysmorphic concerns. In B. Mathes and B. Summers (Chairs), *Recent advances in OC spectrum disorders: A transdiagnostic and translational perspective*. Symposium accepted to the 52nd Association for Behavioral and Cognitive Therapies Convention, Washington, D.C.

14. Perry, M. M., Boullion, G. Q., **Witcraft, S. M.**, Viana, A., & Dixon, L. J. (2018, November). *The importance of a mother's perceived ability to regulate emotions in postpartum maternal quality of life and parenting distress*. Poster accepted to the 52nd Association for Behavioral and Cognitive Therapies Annual Convention, Washington, D.C.

13. **Witcraft, S. M.** & Dixon, L. J. (2018, April). *Examining emotion regulation differences in prescription drug abusers and non-users*. Data Blitz presented at the 5th annual University of Mississippi Psychology Research Day, Oxford, MS.

12. Olson, S., **Witcraft, S. M.**, & Dixon, L. J. (2018, April). *Examination of dental anxiety in relation to anxiety sensitivity, pain sensitivity, and distress tolerance*. Poster presented at the 5th annual University of Mississippi Psychology Research Day, Oxford, MS.

11. Cantrell, A. N., Young, G. K., **Witcraft, S. M.**, & Dixon, L. J. (2018, April). *Prescription stimulants and polysubstance use among college students*. Poster presented at the 5th annual University of Mississippi Psychology Research Day, Oxford, MS.

10. Vrijsen, J. N., Dainer-Best, J., **Witcraft, S. M.**, Papini, S., Müller, B., Hertel, P., Beevers, C. G., Becker, E. S., Tendolkar, I., & Smits, J. A. J. (2018, July). Retrieval-based memory bias modification for depression. In M. Weymar (Chair), *Current Research and Emerging Directions in Emotional Memory: Evidence from Healthy Functioning, Psychopathology, and Interventions*. Symposium accepted as the 4th annual meeting of the International Conference of the European Society for Cognitive and Affective Neuroscience, Leiden, The Netherlands.

9. Dixon, L. J. & **Witcraft, S. M.** (2017, November). Anxiety sensitivity and quality of life among adults with dermatological conditions. In L. Dixon (Chair), *Expanding the AS horizon: Recent advances in the study of anxiety sensitivity among individuals with medical conditions*. Symposium presented at the 51st annual meeting of the Association for Behavioral and Cognitive Therapies, San Diego, CA.

8. **Witcraft, S. M.**, Dixon, L. J., Perry, M. M., Gratz, K. L., & Tull, M. T. (2017, November). *Correlates of nonmedical use of prescription drugs among patients with co-occurring anxiety and substance use disorders*. Poster presented at the 51st Association for Behavioral and Cognitive Therapies Annual Convention, San Diego, CA.

7. **Witcraft, S. M.**, & Dixon, L. J. (2017, September). Prescription drug use and trait characteristics of psychopathology in an undergraduate sample. In Perry, M. M. (Chair), *The Age of Anxiety: Exploring and Assessing Anxiety and Its Problematic Health Correlates*. Symposium presented at the 68th annual meeting of the Mississippi Psychological Association, Biloxi, MS.

6. **Witcraft, S. M.**, & Dixon, L. J. (2017, April). *Prescription opioid and anxiolytic use and trait characteristics of anxiety in an undergraduate sample*. Data Blitz presented at the 4th annual University of Mississippi Psychology Research Day, Oxford, MS.

5. **Witcraft, S. M.**, Davis, M. L., Baird, S. O., & Smits, J. A. J. (2016, October). *Increased use of negative emotion words during public speaking exposures predicts greater decreases in social anxiety symptoms*. Poster presented at the 50th Association for Behavioral and Cognitive Therapies Annual Convention, New York, NY.

4. Baird, S. O., Davis, M. L., **Witcraft, S. M.**, & Smits, J. A. J. (2016, April). *Linguistic Analysis as a Correlate of Fear Activation and Social Anxiety Change*. Poster presented at the 36th Anxiety and Depression Association of America Annual Conference, Philadelphia, PA.

3. **Witcraft, S. M.**, Powers, M. B., Gillespie, E. M., Kauffman, B. Y., Becker, E., Cuijpers, P., Van Ameringen, M. & Smits, J. A. J. (2015, November). *A meta-analysis of psychological and pharmacological treatments for generalized anxiety disorder (GAD).* Poster presented at the 49th Association for Behavioral and Cognitive Therapies Annual Convention, Chicago, IL.

2. **Witcraft, S. M.**, Davis, M. L., Julian, K., Beard, C., Schmidt, N. B., Powers, M. B., & Smits, J. A. J. (2015, April). *Correlating attention bias to social anxiety symptom severity: A second look using Trial Level Bias Score*. Poster presented at the 35th Anxiety and Depression Association of America Annual Conference, Miami, FL.

1. **Witcraft, S. M.**, Shaw, A. M., Pedersen, E. J., & Timpano, K. R. (2013, October). *The relationship between traumatic life events and hoarding symptoms*. Poster presented at the 40th annual meeting of the Society for Advancement of Chicano and Native Americans in Science, San Antonio, TX.

RESEARCH POSITIONS AND EMPLOYMENT

2016– **Graduate Research Assistant**
Health and Anxiety Research and Treatment Lab, University of Mississippi
Supervisor: Laura J. Dixon, Ph.D.

- Online Assessment of Mental Health Symptoms and Dermatology (Skin) Conditions
- Examination of Social Anxiety Symptoms and Externalizing Behaviors

2017–2018 **Graduate Research Assistant**
Mississippi Contextual Psychology Lab
Supervisors: Kelly G. Wilson, Ph.D. & K. Kate Kellum, Ph.D.

2017–2018 **Graduate Research Assistant**
St. Jude Children's Research Hospital
Supervisor: Valerie M. Crabtree, Ph.D.

- Light Therapy to Increase Energy in Adolescents and Young Adults Newly Diagnosed with Solid Tumors: A Pilot Study
- Examining Sleep and Family Functioning and Pediatric Craniopharyngioma using Ecological Momentary Assessment

2014–2016 **Project Coordinator**
Anxiety & Health Behaviors Lab, University of Texas-Austin

Supervisors: Jasper A. J. Smits, Ph.D. & Mark B. Powers, Ph.D.

- *NIMH 1R34-MH099218-01A1*: Dose Timing of D-Cycloserine to Augment CBT for Social Anxiety Disorder
- Worry Exposure for Generalized Anxiety Disorder
- Memory Bias Modification in Independent Samples of High-Ruminating and Dysphoric Individuals: Effects on Mood, Autobiographical Memory, and Recall After One Week

2013–2014 **Undergraduate Research Assistant**
Program for Anxiety, Stress, and OCD, University of Miami
Supervisor: Kiara R. Timpano, Ph.D.

2011–2012 **Undergraduate Research Assistant**
Schizophrenia Family Lab, University of Miami
Supervisor: Amy Weisman de Mamani, Ph.D.

CLINICAL EXPERIENCE

2018– **Mental Health Therapist**
The Baddour Center
Supervisor: Joshua C. Fulwiler, Ph.D.

2016– **Graduate Therapist**
Psychological Services Center, University of Mississippi
Supervisor: Laura J. Dixon, Ph.D.

2016–2017 **Dialectical Behavior Therapy Skills Group Co-Leader**
Psychological Services Center, University of Mississippi
Supervisor: Laura J. Dixon, Ph.D.

2015–2016 **Clinical Interviewer & Assessor**

Anxiety & Health Behaviors Lab, University of Texas-Austin
Supervisors: Jasper A. J. Smits, Ph.D. & Mark B. Powers, Ph.D.

2014–2016 **Protocol Therapist**
Anxiety & Health Behaviors Lab, University of Texas-Austin
Supervisor: Jasper A. J. Smits, Ph.D.

2014–2016 **Clinic Coordinator**
Anxiety & Stress Clinic, University of Texas-Austin
Supervisors: Jasper A. J. Smits, Ph.D. & Mark B. Powers, Ph.D.

2013 **Group Facilitator for Self-Directed Cognitive Behavioral Therapy for Hoarding Disorder**
Program for Anxiety, Stress, and OCD, University of Miami
Supervisor: Kiara R. Timpano, Ph.D.

2011–2014 **Practicum Clinic Office Assistant**
Psychological Services Center, University of Miami
Supervisor: Saneya Tawfik, Ph.D.

ATTENDED WORKSHOPS AND TRAININGS

2016 *Exposure Therapy for Generalized Anxiety Disorder*, specialized training
Completed March 25, 2016
Institute for Mental Health Research, University of Texas-Austin

2015 *Prolonged Exposure Therapy for PTSD*, specialized training
Completed September 11 and 18, 2015
Anxiety & Health Behaviors Lab, University of Texas-Austin

2015 *SCID-101 for DSM-IV Training Series*
Anxiety & Health Behaviors Lab, University of Texas-Austin

TEACHING AND MENTORING

2017– **Undergraduate Honors Thesis Graduate Student Mentor**
Examination of Dental Distress and Anxiety-Related Vulnerability Factors
Sydney Olson, University of Mississippi

2017– **Undergraduate Research Assistant Supervisor**
Health and Anxiety Research and Treatment Lab, University of Mississippi

Spring 2018 **Guest Lecturer**
"Abnormal Psychology, Anxiety, Stress, and Depressive Disorders"
Course: General Psychology, University of Mississippi
Instructor: Marcela Weber, M.A.

Fall 2017 **Guest Lecturer**
"Obsessive-Compulsive Spectrum Disorders"
Course: Abnormal Psychology, University of Mississippi
Instructor: Laura J. Dixon, Ph.D.

Summer 2017 **Teaching Assistant**
Course: Abnormal Psychology (web-based), University of Mississippi
Instructor: Jennifer Caldwell, Ph.D.

Fall 2016 **Guest Lecturer**
"Generalized Anxiety Disorder"
Course: Abnormal Psychology, University of Mississippi
Instructor: Laura J. Dixon, Ph.D.

2014–2016 **Research Assistant Training Supervisor and Mentor**
Anxiety & Health Behaviors Lab, University of Texas-Austin

2012–2014 **Student Mentor**
Counseling Outreach and Peer Education
Counseling Center, University of Miami
Supervisor: Kimberly Martin, MSW, LCSW

AD HOC REVIEWING EXPERIENCES/ACTIVITIES

Behaviour Research and Therapy
Children's Health Care
Clinical Practice in Pediatric Psychology
Clinical Psychology Review
Cognitive Therapy and Research
Frontiers in Psychology
Journal of Clinical Sleep Medicine
Journal of Consulting and Clinical Psychology
Journal of Neuro-Oncology
Journal of Nervous and Mental Disease
Pediatrics
Sleep
Sleep Health: Journal of the National Sleep Foundation
Sleep Medicine

PROFESSIONAL AFFILIATIONS

Association of Behavioral and Cognitive Therapies