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Development and Preliminary Validation of a Nonmedical Prescription Drug Motives Questionnaire

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Development and Preliminary Validation of a Nonmedical Prescription Drug Motives
Questionnaire

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Psychology

by

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Abstract

The prevalence of nonmedical prescription drug (NMPD) use continues to increase among emerging adult populations; however, little is known about the motivations behind this use. The current study aimed to extend previous research by developing and validating the first known comprehensive NMPD motives measure. As such, the primary focus of the current study was to examine evidence for the reliability and validity of the NMPD Motives Questionnaire by assessing the factor structure, internal consistency, and construct validity of the motives scale. Participants were drawn from a larger study of college student substance use behaviors and attitudes ($N = 1,427$; $M_{\text{age}} = 19.8$; 65% female; 48.5% White Non-Hispanic) from two public universities in the United States. From the larger sample, 423 individuals ($M_{\text{age}} = 19.9$; 62% female; 53% White Non-Hispanic) reported lifetime NMPD use and thus were included in the final study sample. Participants completed online self-report questionnaires, including the NMPD Motives Questionnaire. Following data reduction procedures, the final measure included 20-items in which respondents indicated reasons they use NMPDs on a scale of 1 (*Almost Never/Never*) to 5 (*Almost Always/Always*). Exploratory factor analyses revealed a four-factor model of NMPD motives; including: social/recreation, performance, conformity, and self-medication. Results of the current study suggest the overall scale and each of the four subscales of the NMPD Motives Questionnaire demonstrate good to excellent internal consistency, providing evidence for reliability. Moreover, results also suggest strong convergent, discriminant, and concurrent validity of the developed NMPD motives measure. Similar to patterns observed for other types of substance use, social/recreation, performance, and self-medication motives for NMPD use were found to be significant positive predictors of the frequency of past 6-month NMPD use, after controlling for relevant covariates. Moreover,

findings suggest self-medication NMPD motives significantly predict NMPD-related problems after controlling for use. These findings support incremental validity of the developed measure. Taken together, results of this study support the NMPD Motives Questionnaire as a potentially psychometrically sound instrument for measuring motives for NMPD use.

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DEDICATION

This dissertation is dedicated to my parents, Mike and Debbie Milner, and to my brother Brandon Milner. I would not be where I am today without the strength and values instilled in me by my parents. Their love and support has been my rock throughout this educational journey. Thank you for always standing by me as I pursue my dreams.

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Development and Preliminary Validation of a Nonmedical Prescription Drug Motives Questionnaire

Emerging Adulthood

Emerging adulthood has been identified as a critical developmental period in which an individual transitions from adolescence to adulthood (Arnett, 2000; 2005). While generally defined as spanning the ages of 18 to 25, Arnett (2005) reported that this period may continue through the twenties (i.e., ages 18-29). Emerging adulthood is characterized by an increase in autonomy combined with a notable shift in social context, social roles, and normative expectations for their behavior. In addition, national studies have consistently identified emerging adulthood as the age period in which prevalence is highest for most types of drug use. According to the 2013 National Survey on Drug Use and Health (NSDUH), those aged 18-25 reported the highest rates of alcohol use (70%), current binge alcohol use (43%), tobacco use (37%), marijuana use (19%), and other illicit drug use (21%) compared to any other age group.

Previous research has highlighted the role of five distinct features of emerging adulthood that may be associated with the apparent increased vulnerability to substance use during this developmental period (Sussman & Arnett, 2014). Specifically, Arnett (2000, 2004, 2005) characterized emerging adulthood as the age of (a) identity exploration, (b) instability, (c) possibilities, (d) self-focus, and (e) feeling in-between. Identity exploration refers to a feature in which the emerging adult explores who they are and who they want to be. As part of this exploration, the individual may be more likely to pursue a variety of new and intense experiences (e.g., sensation seeking) and engage in risky behaviors (e.g., substance use) before they reach adulthood. Alternatively, identity exploration may generate internal distress and confusion about who they are which may result in the emerging adult to use substance to cope. Similarly, the

instability in social context and other disruptions that are often present during this developmental period may promote substance use to cope or self-medicate in an attempt to reduce negative affect. The third feature, characteristic of emerging adulthood is the “age of possibilities.” Arnett (2005) describes this feature as being extremely optimistic with unlimited hopes and dreams for the future. In terms of substance use, this overly optimistic outlook may contribute to the emerging adult ignoring any potential negative consequences of their behaviors, such as car accidents, being arrested, or developing a substance use disorder. Being self-focused appears to be associated with less concern about damaging relationships within the social network (i.e., social control) and therefore may increase the likelihood of engaging in risky, non-normative behaviors. Finally, the “age of in-between” refers to the individual not feeling like an adolescent or an adult and consequently may believe that their substance use behaviors are normal and that they will grow out of them when they become an adult. Taken together, emerging adulthood is a key period for the initiation of problematic substance use behaviors and thus an important target population for prevention efforts.

Nonmedical Prescription Drug Use

Over the past two decades, prevalence rates of nonmedical prescription drug (NMPD) use (i.e., using a prescription drug without a legitimate prescription or taking a prescription drug in ways not prescribed by a physician) have rapidly increased in the United States (U.S.) and constitute an important public health concern. According to the 2013 NSDUH, an estimated 7 million (2.5 percent) persons, aged 12 or older, reported NMPD use in the past month. Similar to age-related trends seen with other substances, individuals aged 18-25 report the highest rates of NMPD use, abuse, and dependence based on the *DSM-IV* criteria (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). Importantly, research suggests that

among this age group, college students may be at a particularly high risk for NMPD use compared to their non-college peers (Herman-Stahl, Krebs, Kroutil, & Heller, 2007; McCabe, Teter, & Boyd, 2006). The literature generally recognizes four distinct classes of nonmedical prescription drugs (see McCabe, Boyd, & Teter, 2009): (a) Pain relievers (e.g., opioids such as Vicodin®, OxyContin®, Percocet®, Tylenol with codeine, oxycodone); (b) Stimulants (e.g., Ritalin®, Adderall®); (c) Sleeping/Sedative medications (e.g., Ambien®, Seconal®); and (d) Tranquilizers (e.g., Xanax®, Valium®). Between 1993 and 2005, rates of all four of types of these prescription drugs increased substantially (ranging from 93% - 450%) among college students (National Center on Addiction and Substance Abuse [NCASA], 2007). Moreover, previous studies indicate that with the exception of marijuana, college students report higher rates of NMPD use than all other forms of illicit drug use (e.g., cocaine, heroin, inhalants; McCabe & Teter, 2007; NCASA, 2007).

In addition to being highly prevalent, NMPD use has been linked to a number of problems and risky behaviors within young adult and college student samples. Specifically, individuals who endorse NMPD use indicate higher rates of unintentional injuries, motor vehicle crashes, physical fights, academic problems, and unplanned and unprotected sex (Benotsch, Koester, Luckman, Martin, & Cejka, 2011; Herman-Stahl et al., 2007; Martins, Storr, Zhu, & Chilcoat, 2009). Benotsch and colleagues (2011) found that young adults (ages 18-25) who endorse NMPD use were more likely to have multiple sex partners, to have sex after drinking or using other drugs, and to have engaged in unprotected sex when compared to their non-using counterparts. Moreover, evidence suggests that a sizeable proportion of individuals that report NMPD use meet criteria for *DSM-IV* NMPD abuse or dependence (Kroutil et al., 2006; Zacny et al., 2003). McCabe and colleagues (2007) found that an estimated 21-31% of college students

who report NMPD use will develop abuse, while 6-13% will develop dependence during their lifetime.

Taken together, the epidemiological trend of increasing NMPD use among college students combined with the association between NMPD use and adverse outcomes, suggest the need to better understand the psychological factors influencing the use of these drugs. Though limited research has explored potential motives, or reasons, for using NMPDs (McCabe, Cranford, Boyd, & Teter, 2007; McCabe, Teter, & Boyd, 2005; Rigg & Ibanez 2010; Teter, McCabe, Cranford, Boyd, & Guthrie, 2005), there is no known standardized instrument designed and validated to measure motivations for NMPD use. Therefore, the purpose of the present research is to develop and test the psychometric properties of an instrument, called the “Nonmedical Prescription Drug Motives Questionnaire.”

Motives versus Expectancies

While several explanatory factors have been implicated when examining problematic substance use among emerging adults, evaluative cognitions about substances such as expectancies and motives are perhaps the most predictive (Carey & Correia, 1997; Christiansen & Goldman, 1983; Read, Wood, Kahler, Maddock & Palfai, 2003). The majority of the research to date has examined substance use expectancies and motives in relation to alcohol use behaviors. Alcohol expectancies are conceptualized as a distal factor that begins well before an individual initiates alcohol use and refer to beliefs about the positive and negative effects of consuming alcohol (Brown, Goldman, Inn, & Anderson, 1980; Christiansen, Goldman, & Inn, 1982; Goldman, Del Boca, & Darkes, 1999). Previous research has consistently supported the association between positive alcohol expectancies (e.g., I would be friendly) and reported alcohol use (e.g., Ham, Stewart, Norton, & Hope, 2005; Nicolai, Demmel, & Moshagen, 2010;

Reis & Riley, 2000; Zamboanga, Leitkowski, Rodriguez, & Cascio, 2006; Zamboanga, Schwartz, Ham, Borsari, & VanTyne, 2010). Findings related to negative alcohol expectancies (e.g., I would feel guilty) and reported use are less clear; however, across studies positive alcohol expectancies have been a stronger predictor of problematic use than negative alcohol expectancies (Leigh & Stacy, 1993, Valdivia & Stewart, 2005). For a more thorough review of alcohol expectancies among emerging adults, see Ham and Hope (2003).

Motives are conceptualized as a proximal factor of substance use behavior and refer to the values or psychological function placed on the desired effect of the substance use, which in turn serves as motivation for use (Cox & Klinger, 1988). In other words, the substance use can produce an outcome that is of value to the person and thus motivates them to engage in substance use behaviors. While conceptually distinct, alcohol expectancies and drinking motives are considered to be highly correlated concepts. Previous research suggests that alcohol expectancies are developed prior to drinking motives (Cooper, Frone, Russell, & Mudar, 1995) and as such an individual who has a positive alcohol expectancy related to social function may be more likely to report social motives for use (Cooper, 1994). Research has consistently demonstrated that drinking motives are powerful predictors of problematic alcohol use among emerging adults (Carey & Correia, 1997; Ratliff & Burkhart, 1984).

Motivational Models of Substance Use

Motivation is a multifaceted construct that captures the internal and external drives that influence a person's behavior (Mitchell, 1982). As mentioned above, research and theory suggests that motivation is a critical mechanism in understanding substance use behaviors (Cooper, 1994; Cox & Klinger, 1988; Simons, Correia, Carey, & Borsari, 1998). Specifically, motives for substance use provide insight into the circumstances and context of substance use

behaviors which holds important implications for prevention and intervention efforts (Cooper, 1994).

Models of motivation for substance use have been conceptualized as demonstrating two underlying dimensions, namely valence (positive or negative reinforcement) and source (internal or external source; see Cooper, 1994; Cox & Klinger, 1988). Briefly defined, positive reinforcement occurs when a person receives a pleasurable sensation or experiences an appetitive state following a behavior that in turn drives them to repeat the behavior. Negative reinforcement, on the other hand, occurs when the person avoids a negative outcome or aversive state following a behavior that in turn drives them to repeat the behavior. Taken together, research indicates that a person's substance use behaviors are typically motivated by the desire to obtain a specific outcome (e.g., enhance positive mood or regulate negative affect).

Drinking Motives. To date, the majority of literature examining motivational models of substance use has focused on (or been adapted from) models of drinking motives (e.g., Carey & Correia, 1997; Cooper, 1994; Cox & Klinger, 1988; Gire, 2002; Lee, Neighbors, Hendershot, & Grossbard, 2009; Simons et al., 1998; Stewart, Zeitlin, & Samoluk, 1996). Cooper (1994) developed the most commonly used measures of drinking motives, the Drinking Motives Questionnaire (DMQ-R), which assesses four distinct, theoretically driven classes of motives for alcohol use: (1) *enhancement* (e.g., "Because you like the feeling"), (2) *social* (e.g., "Because it makes social gatherings more fun"), (3) *coping* (e.g., "To forget your worries"), and (4) *conformity* (e.g., "To fit in with a group you like"). Enhancement and social motives are associated with positive reinforcement, by increasing either positive affect (internal source) or enjoyment in a social function (external source). Coping and conformity, on the other hand, are associated with negative reinforcement, by either avoiding negative affect (internal source) or

avoiding social criticism (external source). Drinking motives are strong predictors of heavy alcohol use and alcohol-related problems (Carey & Correia, 1997; Cooper et al., 1995; Simons et al., 1998). Research suggests that coping motives and enhancement motives are most strongly associated with negative consequences and problems. Enhancement motives typically exhibit indirect associations with alcohol use and problems (Cooper et al., 1995; Read et al., 2003), while coping motives exhibit both direct and indirect associations with alcohol use and problems (Cooper et al., 1995; Simons et al., 1998).

Marijuana use motives. Repeated empirical support for a motivational model of alcohol use prompted researchers to examine the utility of a motivational model in regards to other substances. Simons, Correia, Carey, and Borsari (1998) adapted and extended Cooper's (1994) DMQ-R to examine the motives involved in marijuana use. The fifth motives scale in the MMM was created by 1) using three items from Newcomb, Chou, Bentler and Huba's (1988) motives scale, which is a measure designed to assess the generality of motives across both alcohol and marijuana, and 2) reviewing relevant literature (*cf.* Simons, Correia, & Carey, 2000). Results supported a five-factor Marijuana Motives Measure (MMM). Similar to drinking motives, enhancement, social, coping, and conformity were found as distinct factors influencing use. Additionally, the MMM introduced a unique motive in marijuana use: expansion (e.g., "To expand your awareness").

Within the motivational model, expansion motives are considered to be another facet of positive reinforcement by "expanding experiential awareness" (internal source). In a comparison of alcohol and marijuana motives, Simons et al. (2000) found differing functional roles of alcohol and marijuana use among users. In other words, Cooper's (1994) DMQ-R and Simons et al. (1998) MMM were able to discriminate between the motivations driving reported use of

different substances. Furthermore, coping and conformity motives were shown to generalize across drugs. This provides support for the existence of distinct motives for each type of substance use, in addition to possible universal motive factors for substance use generally.

Smoking Motives. Within the literature, smoking motives have also been widely studied in order to better understand smoking-related behaviors, problems, and use. Ikard, Green, and Horn (1969) suggest a six-factor model of smoking motives, including *stimulation* (e.g., “I smoke cigarettes to stimulate me, to perk myself up”), *pleasurable relaxation* (e.g., “Smoking cigarettes is pleasant and relaxing”), *sensorimotor manipulation* (e.g., “Handling a cigarette is part of the enjoyment of smoking it”), *habit* (e.g., “I smoke cigarettes automatically without even being aware of it”), *negative affect reduction* (e.g., “When I feel uncomfortable or upset about something, I light up a cigarette”), and *addictive* (e.g., “I get a real gnawing hunger for a cigarette when I haven’t smoked for a while”). While previous research has generally suggested that drinking and smoking motives are positively associated with one another (Novak, Burgess, Clark, Zvolensky, & Brown, 2003), there are several important conceptual and theoretical differences in motivations for use when comparing these substances. Specifically, research examining other substance use behaviors, such as alcohol and marijuana, have not revealed habitual or sensory motivations for use. These factors appear to be unique to smoking behaviors. In addition, tobacco use is a legal behavior in the U.S. for adults 18 and older with consequences of use centering on health effects. While alcohol use is also considered a legal behavior for U.S. adults aged 21 years and older, consequences of use may include health effects as well as a myriad of other problems, including unintentional injuries, missing classes/work, engaging in unplanned and/or unprotected sexual activity, forgetting what they did, property damage, and legal problems (e.g., DUI, public intoxication, arrests; Wechsler et al., 2000). Taken together

motivations for smoking appear to be conceptually different from motivations for alcohol use and other illicit substances.

NMPD Use Motives Research

The shared theories and significant empirical overlap associated with both marijuana and alcohol use motives suggest that an expansion of the motivational models of substance use could be appropriate for application to measurement of NMPD use motives. For example, tension reduction and social influence are commonly associated with substance use in general (Arnett, 2005, Simons et al., 1998), which align with motives for alcohol and marijuana use. Research indicates that a considerable portion of young adults report “self-treatment” and recreation/enhancement motives for NMPD use (Babcock & Byrne, 2000; Barrett, Darredeau, Bordy, & Pihl, 2005; Boyd, McCabe, Cranford, & Young, 2006; McCabe et al., 2007; McCabe et al., 2009; Teter et al., 2005). Boyd and McCabe (2008, p. 2) define self-treatment as being “motivated by the desire to alleviate symptoms consistent with prescription drug’s pharmaceutical main indication and does not involve the co-ingestion with alcohol or other drugs or non-therapeutic routes of administration.” While some common motivational factors are expected to underlie alcohol, marijuana, and NMPD use, previous models do not account for motives unique to NMPD use and may omit key predictors of use. Specifically, across prescription drug classes individuals consistently report self-medication motives (McCabe et al., 2009; Rozenbroek & Rothstein, 2011). Self-medication is expected to be different from previously mentioned coping or self-treatment motives in that it is expected to be associated with negative reinforcement but reflect a mix of internal and external sources of reinforcement. Self-medication as a unique motive for NMPD use is expected to better capture the complexity of NMPD use given the differing physiological effects of the four drug classes. For example,

stimulant users may report motives related to internal sources of reinforcement (e.g., alleviate problems with attention and concentration; Aikins, 2011; Judson & Langdon, 2009; Teter et al., 2005; Upadhyaya et al., 2010) and external sources of reinforcement (e.g., perform better on school work, or in other words, to avoid bad school performance; DeSantis, Webb & Noar, 2008; Low & Gendaszek, 2002; Weyandt, et al., 2009). Both motives indicate the desire to avoid a negative outcome through self-medication. Other examples of self-medication motives for NMPD use include weight loss/appetite suppression (DeSantis et al., 2008; Judson & Langdon, 2009; Low & Gendaszek, 2002; Rabiner et al., 2008), pain management (Lord, Brevard & Budman, 2011; McCabe et al., 2007), counteracting the effects of other drugs (Judson & Langdon, 2009; Teter et al., 2005), and coping with negative affect (Aikins, 2011; Lord et al., 2011; Rabiner et al., 2009).

To date, the majority of studies examining college student motives for NMPD use have focused on two specific prescription drug class; namely, stimulants or opioids. Little research has focused on sedative or tranquilizer use motives, on NMPD use motives as a group, or on polydrug use related to NMPDs.

Stimulants. The majority of empirical articles that examine NMPD use motives among college students focus specifically on stimulant misuse (Aikins, 2011; Barrett et al., 2005; DeSantis et al., 2008; DuPont, Coleman, Bucher, & Wilford, 2008; Judson & Langdon, 2009; Low & Gendaszek, 2002; Rabiner et al., 2008, 2009; Teter et al., 2005; Teter, McCabe, LaGrange, Cranford, & Boyd, 2006; Upadhyaya et al., 2010; Weyandt et al., 2009).

Drawing on findings from both quantitative surveys ($n = 585$) and qualitative interviews ($n = 175$), DeSantis and colleagues (2008) examined motives for the repeated nonmedical use of prescription stimulants. Overall, findings indicate two overarching categories of motives for

nonmedical stimulant use; namely, academic motives and nonacademic motives. Academic motives were defined as stimulant use for the “more serious pursuit of getting good grades.” Within this academic motivation category, results revealed three common reasons for nonmedical stimulant use. Specifically, 72% of the total nonmedical user sample reported using stimulants to stay awake and study, 66% reported using to concentrate on work, and 36% reported using to help memorize information. Importantly, the authors highlight that based on the interviews conducted, these motives are largely driven by a desire to study for longer periods of time or to reduce distractibility and increase productivity. While it is clear based upon the higher percentage of individuals indicating academic motives that doing better in school is a central motive for stimulant use, the authors also examined nonacademic motives. Defined as motives for use deriving from recreational or social purposes, nonacademic motives included: staying awake to have fun (22%), making work more interesting (12%), to get high (7%), to suppress appetite (5%), and self-medication (4%). Interviewer comments suggested that the common thread among nonacademic motives were either to increase energy levels (e.g., reduce fatigue) or to be more outgoing at social events.

Perhaps not surprisingly, academic motives (e.g., to study, increase concentration, increase alertness, perform better on tests or schoolwork) were among the most commonly reported motives for nonmedical prescription stimulant use among college student samples using quantitative (Aikins, 2011; Barrett et al., 2005; DeSantis et al., 2008) and qualitative methods (DuPont et al., 2008; Judson & Langdon, 2009; Low & Gendaszek, 2002; Rabiner et al., 2008, 2009; Teter et al., 2005, 2006; Upadhyaya et al., 2010; Weyandt et al., 2009).

Across multiple studies, students appeared to report similar types of nonacademic motivations for stimulant use, including: to get high (Judson & Langdon, 2009; Rabiner et al.,

2008; Teter et al., 2005, 2006), party (DuPont et al, 2008; Low & Gendaszek, 2002), counteract the effects of another substance (Teter et al., 2005; Low & Gendaszek, 2002; Rabiner et al., 2008), experimentation (Judson & Langdon, 2009; Teter et al., 2006), lose weight (Judson & Langdon, 2009; Rabiner et al., 2008), exercise (Judson & Langdon, 2009; Low & Gendaszek, 2002), self-medication (Rabiner, 2009; Upadhyaya et al., 2010), and calming effects (Aikins, 2011). Overall, nonacademic motives were consistently reported less frequently than academic motives, with the exception of one study. Barrett and colleagues (2005) found academic motives (e.g., to help study) were only reported by 30% of the students engaging in nonmedical prescription stimulant use, whereas 70% of this population reported “recreational use” to be their primary motives for stimulant use. Moreover, among the students who identified as being recreational users, a striking 77.1% also reported using other psychoactive substances (e.g., alcohol) simultaneously.

Garnier-Dykstra, Caldeira, Vincent, O’Grady, and Arria (2012) present the only longitudinal study to examine motivations for any type of NMPD use among college students; however, it should be noted that the study is somewhat limited in scope given its exclusive focus on nonmedical prescription stimulant use. Participants ($n = 1,253$) were assessed at four time points (i.e., Years 1, 2, 3, and 4 of college) and completed both self-report surveys and a face-to-face interview. Results of these qualitative data suggest that motives for nonmedical prescription stimulant use change over time as the student advances in college. Specifically, students in their early years of college were more likely to indicate curiosity or experimentation as motivation for use. Alternatively, students who were in their later years of college were more likely to report academic motives (e.g., studying). Drawing upon these findings, the authors posit that over the course of one’s college years motivations for nonmedical prescription stimulant use may shift

from novelty seeking purposes to the pursuit of an “academic shortcut.” However, an examination of the connection of these motives to actual NMPD use outcomes as well as a quantitative analysis of NMPD use motives is lacking in the literature.

Taken together, the existing literature suggests that motivations for nonmedical prescription stimulant use among college students typically fall within two broad categories: academic motives and nonacademic motives (see DeSantis et al., 2008). Academic motives were by far the most common reason for use reported by college students engaging in the nonmedical use of prescription stimulants.

Opioids. Only two articles have examined motivations for the nonmedical use of prescription opioids among college students. McCabe and colleagues (2007) found college students most frequently reported one of three motivations for nonmedical prescription opioid use; namely: to relieve pain, to get high, and experimentation. Generally consistent with the aforementioned study, Lord and colleagues (2011) found relaxation, to get high, to have fun, and experimentation as being the most commonly reported motives for nonmedical prescription opioid use among college students. Although somewhat less prevalent, other motives for nonmedical prescription opioid use included: self-medication (e.g., to cope with depression, to manage pain), weight management, and academic enhancement. One study has found support that motives for nonmedical opioid use were associated with nonmedical opioid use.

Specifically, individuals who reported regular opioid use were also more likely to report motives for to be to relax, to get high, or to have fun compared to students who reported less frequent or no use in the past year (McCabe et al., 2007). Taken together, college students appear to be engaging in nonmedical prescription opioid use for the purposes of either getting high or self-

medicating (including pain management and to cope with depression or tension), and there is some evidence that these motives are associated with use.

“All” drug types. Only two known publications have focused on motives for “all” drug types separately among a college student sample. Rozenbroek and Rothstein (2011) found that regardless of drug type (e.g., stimulants, depressants, or opioids); academic enhancement was the most commonly reported reason for engaging in the use of a prescription drug for nonmedical purposes. Specifically, approximately 54% of stimulant users, 22% of depressant users, and 4% of opioid users identified academic motives as their principles reasons for use. Holloway and Bennett (2012) examined motives for NMPD use among a non-U.S. (Wales) college student population. Findings suggest that motivations for NMPD use differed according to the specific drug type. In accordance with the expected effect of the drug, motivations for use of nonmedical prescription depressants (e.g., sleeping aids, sedatives, and anti-depressants) were most commonly cited as “to sleep” or to manage symptoms of anxiety or depression. Similar to findings presented in U.S. populations (Lord et al., 2011; McCabe et al., 2007), the most common motive reported (93%) by college students for nonmedical prescription opioid use was to relieve pain (e.g., self-medicate). Interestingly, findings related to nonmedical stimulant use in this population were markedly different from studies examining stimulant use among U.S. college students. Specifically, the majority of students reporting nonmedical stimulant use indicated nonacademic motives (e.g., “for pleasure” or “to play sport”), while only 3% of the sample indicated academic motives (e.g., “to study” and “to stay awake).

Taken together, a review of the existing literature revealed the most common motives reported by college students include academic enhancement, self-medication, “to get high,” and to reduce negative affect (McCabe et al., 2006). Additionally, studies of concurrent polydrug use

(e.g., use of different drugs on separate occasions; Newcomb & Bentler, 1988) suggest that individuals may consume different prescription drug types (e.g., depressants, stimulants, opioids, mixed-use) based on the desired effect for a particular situation.

Current study

Motives for substance use are widely regarded as the final common pathway to use and abuse (Cooper, 1994; Cox & Klinger, 1988). Moreover, research indicates that by understanding the motives or “reasons for using” a substance, we gain insight into possible risk level for a given individual as well as the ideal strategies for behavior change. An abundance of literature suggest motives for alcohol and marijuana use are often strong predictors of substance-related problems and consequences (e.g., Cooper, 1994; Simons et al., 1998) Therefore, the development of a comprehensive, psychometrically sound measure of NMPD motives may be important for understanding reasons for NMPD use and their relation to use behaviors. A better understanding of NMPD motives may be an important aspect for guiding the assessment of drug use as well as the development of effective interventions.

The current study aimed to extend previous research on motives for NMPD use by developing and validating a comprehensive NMPD motives measure. A secondary aim in the development of a psychometrically sound measure of NMPD motives was to provide a common language for researchers who seek to examine specific motive dimensions related to the use of NMPDs. The current study examined evidence for the reliability and validity of the NMPD Motives Questionnaire by assessing the factor structure, internal consistency, and construct validity of the motives scale.

In order to accomplish these study aims, several steps were followed. First, a principle component analysis was conducted to examine the factor structure of the NMPD Motives

Questionnaire. It was expected that NMPD motives would have a similar overarching factor structure to those found for drinking and marijuana use motives. As such, five distinct motives scales were expected to emerge from the content items, namely, self-medication, recreation/enhancement, social, conformity, and expansion. Next, reliability was determined by examining internal consistency of the overall model as well as each of the emerging factors. Convergent validity (e.g., the measure is positively correlated with measures of related constructs) and discriminant validity (e.g., the measure is not highly correlated with measures of non-related constructs) was examined by testing associations between NMPD motives and other substance use motives, positive affect, negative affect, sensation seeking, and demographic variables. It was hypothesized that motives driven by positive reinforcement (i.e., recreation/enhancement, social, expansion) would be highly correlated with positive affect and sensation seeking. Moreover, positive reinforcement motives were expected to be uncorrelated with negative affect. It was also hypothesized that motives driven by negative reinforcement (i.e., self-medication and conformity) would be highly correlated with negative affect and mostly uncorrelated with positive affect and sensation-seeking. Concurrent validity, or the extent to which the measure is associated with theoretically associated outcomes measured at the same time, was examined by testing the association between NMPD motives and NMPD use behaviors (i.e., frequency of use and use-related problems). To more fully test concurrent validity, the ability of motives to predict NMPD use and problems above and beyond relevant covariates was also tested. This provided an index of the measure's incremental validity.

Method

Item Selection

Development of the NMPD Motives Questionnaire. Initial items for the NMPD motives questionnaire were generated based upon 1) a review of identified motives for NMPD use in the literature (Aikins, 2011; Barrett et al., 2005; DeSantis et al., 2008; DuPont et al., 2008; Holloway & Bennett, 2012; Judson & Langdon, 2009; Lord et al., 2011; Low & Gendaszek, 2002; McCabe et al., 2007; Rabiner et al., 2008, 2009; Rozenbroek & Rothstein, 2011; Teter et al., 2005, 2006; Upadhyaya et al., 2010; Weyandt et al., 2009) and 2) a review of items on two existing theoretically-based motives measures [DMQ-R (Cooper, 1994) and MMM (Simons et al, 1998)] and one data-driven motives measure [MMQ (Lee et al., 2008)]. The author initially generated a list of 82 items by drawing from previous motives measures of other substances and the current literature examining motives for NMPD use. The items were then categorized into five different motive categories based upon theory of substance use motivations (Cooper, 1994; Cox & Klinger, 1988) and a review of relevant literature. The five expected motive categories include: self-medication, recreation/enhancement, social, conformity, and expansion. The self-medication category included items that were thought to reflect motivation driven by negative reinforcement or the avoidance of negative outcomes that arise from internal sources. Self-medication was expected to include motives related to six subcategories including, coping with negative affect (e.g., “to forget about your problems”), pain management (e.g., “because it relieves your pain”), counteracting the effects of other drugs (e.g., “to avoid withdrawal from alcohol or other drugs”), coping with sleep difficulties (e.g., “to help you sleep”), improving attention/alertness (e.g., to reduce inattention), and weight/appetite management (e.g., “to lose weight”). The recreation/enhancement category includes items that are thought to reflect motivation driven by positive reinforcement through internal sources, specifically to increase positive affect such as experiencing a pleasant feeling (e.g., “because it’s fun”). The social

category includes items that are thought to reflect motivation driven by positive reinforcement from external sources, specifically increase positive social outcomes (e.g., “because it helps you enjoy a party”). The conformity category includes items that are thought to reflect motivation driven by negative reinforcement from external sources, specifically to avoid peer rejection (e.g., “so you won’t feel left out”). Finally, the expansion category includes items that are thought to reflect motivation driven by positive reinforcement, specifically expanding internal experiences of perceptual and cognitive awareness (e.g., “to understand things differently”). The author then examined each of the five motive categories and selected items that appeared to be a good representation of the individual motive based on the definition of the category. Redundant items ($n = 15$) and items that did not fit into the categories ($n = 12$; e.g., “because it’s readily available”) were eliminated. The final item pool included in preliminary analyses consisted of 55 NMPD motive items that were expected to load onto five distinct factors: self-medication (29 items); recreation/enhancement (8 items); social (5 items); conformity (6 items); and expansion (7 items). The 55-item measure was administered in the current study and ultimately reduced to 20 items for primary analyses, as described in the data analytic strategy and Results sections.

Participants

Participants were drawn from a larger study of college student substance use behaviors and attitudes ($N = 1,427$; $M_{\text{age}} = 19.8$; 65% female; 48.5% White Non-Hispanic) from two public universities in the United States. From the larger sample, 423 individuals reported lifetime NMPD use (i.e., Have you ever used a prescription drug that was not prescribed to you, or used it in ways for which it was not prescribed?) and reported ages between 18 and 29 and thus were included in the final study sample. Participants were predominately women (62%) with a mean age of 19.9 ($SD = 1.75$). The majority of participants identified as White Non-Hispanic (53.0%),

followed by White Hispanic (28.4%), African-American/Black (6.6%), Asian/American Indian/Pacific Islander (4.7%), Hispanic/Latino (4.5%), and those who endorsed “other” (1.9%). Four participants (0.9%) did not report their race/ethnicity. See Table 1 for a complete summary of demographic information for the final study sample and the larger sample from which participants were drawn.

Within the final study sample, 73.7% of participants reported lifetime nonmedical stimulant use and 64.4% reported lifetime nonmedical opioid use. Lifetime nonmedical sedative use and tranquilizer use was less frequent within the current sample, with 32.5% and 35.6% respectively. These findings are consistent with other studies examining NMPD use among emerging adult samples (McCabe, Cranford, Teter, Rabiner, & Boyd, 2012). See Table 2 for a complete summary of lifetime frequency of NMPD use by drug type category.

Measures

Demographics. Participants provided basic demographic information, including gender, age, ethnicity/race, employment, marital status, and year in school (see Table 1).

NMPD Motives Questionnaire. Nonmedical prescription drug motives for use was assessed with the NMPD Motives Questionnaire developed specifically for this validation study, as described above. The NMPD Motives Questionnaire is a 55-item self-report measure in which respondents indicate possible reasons they use NMPDs. This measure was found to center around four factors (see below): social/recreation (e.g., “because it’s fun”); performance (e.g., “to perform better on school work or on tests”); conformity (e.g., “so others won’t kid you about not doing it”); and self-medication (e.g., “to forget about my problems”). Items are assessed on a 5-point scale: 1 = *Almost never/never*, 2 = *Some of the time*, 3 = *Half of the time*, 4 = *Most of the time*, and 5 = *Almost always/always*.

Substance Use Questionnaire. Alcohol, tobacco, and illicit drug use was assessed by self-report. Individuals reported frequency of use in the past 6-months across 10 domains of licit and illicit substances using a 5-point scale: 1 = *Never*, 2 = *Less than monthly*, 3 = *Monthly*, 4 = *Weekly*, 5 = *Daily/Almost daily*. Lifetime use was also assessed using a dichotomous yes/no scale for each of the 10 drug types by asking “Have you EVER used this substance in your lifetime?”

NMPD Use. NMPD use was assessed by self-report. Individuals reported frequency of NMPD use in the past 6-months across the 4 drug types on a 5-point scale: 1 = *Never*, 2 = *Less than monthly*, 3 = *Monthly*, 4 = *Weekly*, 5 = *Daily/Almost Daily*. Participants also reported frequency of lifetime NMPD use across the 4 drug types on a 7-point scale: 1 = *Never*, 2 = *1-3 times*, 3 = *4-6 times*, 4 = *7-10 times*, 5 = *11-20 times*, 6 = *21-40 times*, 7 = *41 or more times*.

NMPD Problems measure. A modified version of the Short Inventory of Problems (SIP-PDM; modified from Blanchard, Morgenstern, Morgan, Labouvie, & Bux, 2003) was used to assess problems related to NMPD use. This measure was adapted for NMPDs by substituting “prescription drug misuse” for “drinking.” Items include statements such as, “I have been unhappy because of my prescription drug misuse” and “My prescription drug misuse has damaged my social life, popularity, or reputation.” The SIP-PDM is a 15-item measure that measures physical, social, intrapersonal, impulsive, and interpersonal consequences of NMPD use. Respondents indicate whether or not each item has occurred (Yes/No) as a result of NMPD use. Each “yes” response is coded as “1” and each “no” is coded as “0” and summed. The SIP has demonstrated excellent internal consistency, regardless of substance category used (Cronbach’s alphas range from .93-.96; Blanchard et al., 2003). Internal consistency in the present study was found to be good ($\alpha = .88$).

Drug Use Motives. The positive scale of the Drug Use Disorders Identification Test – Extended (DUDIT-E; Berman, Palmstierna, Kallmen, & Bergman, 2007) is a 17-item self-report measure assessing positive reasons for substance use (“*What is positive for you about using drugs?*”) across areas of emotional well-being (e.g., “*I can control feelings like anxiety, anger, and depression*”), individual competence (e.g., “*Become creative*”), physical well-being (e.g., “*Sleep better*”), and social competence (e.g., “*With drugs I can function socially*”). Items are assessed on a 5-point scale assessing reasons identified for substance use, ranging from 1 (*Not at all*) to 5 (*Totally*). Berman and colleagues (2007) reported excellent internal consistencies of the positive scale of the DUDIT-E (Cronbach’s $\alpha = .92-.95$). Analysis of internal consistency in the present sample revealed excellent internal consistency ($\alpha = .94$).

Drinking Motives. The Drinking Motives Questionnaire (DMQ-R; Cooper, 1994) is a 20-item self-report questionnaire assessing four motives for drinking: enhancement (e.g., “*I drink to get high*”), social (e.g., “*I drink to be sociable*”), coping (e.g., “*I drink to forget my worries*”), and conformity (e.g., “*I drink so that others won’t kid me about not drinking*”). Items are assessed on a 5-point scale assessing frequency of drinking for each motive, ranging from 1 (*Almost never/never*) to 5 (*Almost always/always*). Each scale consists of five items that are aggregated into average scale scores. This measure has demonstrated sound psychometric properties in large samples of adolescents and adults (Cooper, 1994; Cooper et al., 1995), and across various demographics within college student samples (Ham, Bonin, & Hope, 2007; Ham, Zamboanga, Bacon, & Garcia, 2009; Lecci, MacLean, & Croteau, 2002; Martens, Cox, Beck, & Heppner, 2003; Neighbors, Larimer, Geisner, & Knee, 2004; Stewart, Loughlin, Rhyno, 2001). Internal consistency was found to be good in the present sample (enhancement motives: $\alpha = .87$, social motives: $\alpha = .90$, coping motives: $\alpha = .86$, and conformity motives: $\alpha = .88$).

Affect. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess two global dimensions of affect: (1) negative and (2) positive. The PANAS is a well-established mood measure which consists of 20-items measured across a 5-point Likert scale (1 = *Very slightly or not at all* to 5 = *Extremely*) examining the extent to which they experience different emotions and feelings at the present moment. Both positive and negative affect subscales have demonstrated good convergent and discriminant validity, as well as high levels of internal consistency (Tuccitto, Giacobbi, & Leite, 2010). Construct validity has been supported through use of confirmatory factor analysis techniques in previous studies. In a 2004 study conducted by Crawford and Henry, the best-fitting model (robust comparative fit index = .94) of the latent structure of the PANAS consisted of two correlated factors corresponding to the positive affect and negative affect scales. Crawford and Henry (2004) reported the internal consistency of the PANAS, as measured by Cronbach's alpha, as .89 for positive affect and .85 for negative affect. Analysis of internal consistency in the present sample revealed good to excellent internal consistency (positive affect: $\alpha = .91$, negative affect: $\alpha = .89$).

Sensation Seeking. The Arnett Inventory of Sensation Seeking (AISS; Arnett, 1994) is a 20-item self-report questionnaire assessing two domains of sensation seeking: intensity and novelty. The intensity scale measures the intensity of stimulation of the senses (e.g., "If I were to go to an amusement park, I would prefer to ride the rollercoaster or other fast rides"). The novelty scale measures openness to experience (e.g., "I can see how it would be interesting to marry someone from a foreign country"). Items are assessed on a 4-point scale, ranging from 1 (*describes me very well*) to 4 (*does not describe me at all*). Arnett (1994) reported the internal consistency of the AISS, as measured by Cronbach's alpha, as .70 for the total scale, .50 for novelty subscale, and .64 for the intensity subscale. Within the present sample, internal

consistency was questionable for the overall scale ($\alpha = .60$), poor for novelty sensation seeking ($\alpha = .50$) and unacceptable for intensity sensation seeking ($\alpha = .48$). Similarly low coefficients have been reported by several other studies (see Andrew & Cronin, 1997; Roth & Herzberg, 2004; Zarevski, Marusic, Zolotic, Bunjevac, & Vukosav, 1998). Researchers have postulated that the low internal consistencies of the AISS may be due to problems within the scale development (e.g., selecting items based on content validity rather than psychometric analysis; Roth & Herzberg, 2004). To address low subscale reliability coefficients, a modified AISS scale was utilized in which items with the lowest item scale correlations were removed until the alpha coefficient was maximized. A similar modification procedure has been utilized by several previous researchers due to reliability problems with the AISS (e.g., Haynes, Miles, & Clements, 2000; Ravert et al., 2013; Roth, 2003). Following item reduction, a principal components analysis (varimax rotation) was used to verify that the two dimensional structure of the measure was retained. The procedure resulted in two components (eigenvalues 2.57 and 1.49) that accounted for 37.0% of the total variance (see Table 5), and included a 6-item novelty scale ($\alpha = .60$) and a 5-item intensity scale ($\alpha = .52$). The modified 11-item scale also yielded a slightly higher internal consistency for the overall scale ($\alpha = .64$) within the current sample.

Procedure

The current study was conducted via an online survey at two public universities administered through Qualtrics®. Of note, Qualtrics® provides a high level of security and meets standards for both the Health Insurance Portability and Accountability Act (HIPPA) and the Family Educational Rights and Privacy ACT (FERPA). Students were recruited from psychology courses through the Subject Pool recruitment system and provided a link to an online informed consent form. The informed consent included information about the purpose of the

study, costs and benefits of participation, and contact information for the researcher.

Importantly, identifiable participant information was kept separate from responses to study items and deleted immediately after the end of the semester in which participation occurred. The names of participants were never connected to their responses and no other identifiable information was collected that could connect a participant's identity to their responses.

After participants voluntarily provided consent, indicating that they read and understood the purpose of the study and agreed to participate, they were redirected to a separate survey site to complete the study questionnaires. All measures were presented in counterbalanced order. Upon completion of the study, participants were presented with an electronic debriefing form which included information about the study aims, as well as contact information for the researchers, university Institutional Review Board, and mental health resources. All procedures were approved by the Institutional Review Board.

Data Analytic Plan

Prior to central analyses, data were examined for missingness, normality, and the presence of outliers. Specifically, frequencies and descriptive analyses were examined to determine data errors and appropriate coding of variables. In addition, the data were analyzed for normality to determine the appropriateness of use of various statistical procedures.

The primary data analytic approach consisted of four stages. First, an exploratory principal component analysis (PCA) was conducted to examine the factor structure of the NMPD Motives Questionnaire and identify psychometrically sound and distinct motives for NMPDs. Given the novelty of the NMPD Motives Questionnaire and that no study has empirically identified NMPD use motives factor structure, a confirmatory factor analysis would have been inappropriate at this stage of development (Floyd & Widaman, 1995).

Second, data reduction procedures were used to further reduce the list of items based upon findings in the exploratory PCA of the initial 55-items. Any items that loaded on more than one factor were first removed, leaving 43-items. The item list was further reduced to include five items per subscale, using factor loadings and nonredundancy of item content as primary criteria. The final NMPD Motives Questionnaire included 20 items across four factors (see Table 4). A second PCA was conducted and verified that the four-dimensional structure of the measure was retained in the reduced version. As such, the 20-item NMPD Motives Questionnaire was used for all subsequent analyses.

Third, internal consistency of the overall scale and each of the emerging factors were assessed using Cronbach's alpha. Finally, convergent, discriminant, and concurrent validity of the NMPD Motives Questionnaire was evaluated using Pearson correlations. Convergent validity (e.g., the measure is positively correlated with measures of related constructs) and discriminant (e.g., the measure is not highly correlated with measure of non-related constructs) was examined by testing the association between NMPD motives and other substance use motives (DMQ-R and DUDIT-E), positive affect, negative affect, sensation seeking, and demographic variables. Of note, the DUDIT-E positive scale demonstrated high intercorrelations ($r > .70$) among its four subscales (i.e., emotional well-being, individual competence, physical well-being, and social competence). Moreover, previous studies have indicated problematic factor loadings among the subscales, including cross-loadings and items not loading on thematically expected components (e.g., "physical pain" loaded on the social competence subscale rather than the physical well-being subscale; Berman, 2009). Given the problems related to the aforementioned subscales, analyses included the overall DUDIT-E positive scale as a measure of drug use motives.

Pearson correlations were used to test the hypothesis that motives driven by positive reinforcement (i.e., social/recreation and performance) would be highly correlated with positive affect, sensation seeking, drug use motives, social drinking motives, and enhancement drinking motives. Moreover, positive reinforcement motives were expected to be mostly uncorrelated with negative affect, conformity drinking motives, and coping drinking motives. It was also hypothesized that motives driven by negative reinforcement (i.e., self-medication and conformity) would be highly correlated with negative affect, drug use motives, conformity drinking motives, and coping drinking motives. Further, negative reinforcement motives were expected to be mostly uncorrelated with positive affect, sensation-seeking, social drinking motives, and enhancement drinking motives.

Concurrent validity, or the extent to which the measure is associated with theoretically associated outcomes measured at the same time, was examined by testing the association between NMPD motives and NMPD use behaviors (i.e., frequency of overall NMPD use and use problems). To more fully test concurrent validity, the ability of motives to predict NMPD use and problems above and beyond relevant covariates was tested using hierarchical linear regressions. This provided an index of the measure's incremental validity.

Results

Preliminary Analyses

Data cleaning. Of the larger sample ($N = 1,427$), 438 individuals reported lifetime NMPD use and were considered for inclusion in the current study. Of the 438 NMPD users, nine participants were outside of the study age range, five participants did not complete the study (i.e., did not reach the study's debriefing page), and one participant was identified as a random responder (i.e., answered all "1s" on each measure). These participants were subsequently

removed from the sample. The final data set consisted of 423 participants. See Table 1 for demographic frequencies.

Of note, an experimenter error was made in the questionnaire administered to students at the University of North Texas data collection site. Specifically, the Short Inventory of Problems – PDM, used to assess NMPD-related problems, repeated item #4 (i.e., “*I have felt guilty or ashamed because of my prescription drug misuse.*”) and consequently omitted item #5 (i.e., “*I have taken foolish risks when I have misused prescription drugs.*”). As such, all analyses that included this measure were limited to data collected at the University of Arkansas ($n = 241$).

Checking statistical assumptions. All measures were initially analyzed with respect to means, standard deviations, skewness, and kurtosis. There were no univariate or multivariate outliers. Negative affect, conformity drinking motives, and conformity NMPD motives were positively skewed (skewness statistic >2 ; Tabachnick & Fidell, 2007). All other variables were normally distributed with no significant skew or kurtosis. A logarithmic transformation on the negative affect and drinking conformity motives resulted in statistical normality for both variables. Though analyses using the transformed variables are presented, analyses conducted with untransformed variables resulted in the same pattern of results. No transformations were conducted on conformity NMPD motives as this is a validation study of the NMPD Motives Questionnaire. Scatterplots and correlations suggest linearity and an absence of multicollinearity (Pearson correlations $< .7$; Tabachnick & Fiddell, 2007). See Table 6 for correlation matrix.

Primary Analyses

Exploratory factor analysis. In order to identify psychometrically sound and distinct motives for NMPDs, the 55-items of the NMPD Motives Questionnaire were subjected to an exploratory PCA with oblimin rotation. Prior to performing data reduction procedures, the

suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .96, exceeding the recommended value of .6 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance ($p < .001$), supporting the factorability of the correlation matrix.

A PCA revealed the presence of four components (eigenvalues > 1), explaining 54.4%, 7.8%, 6.5%, and 3.9% of the variance respectively (see Table 3). Results of parallel analysis (Horn, 1965) further supported retention of 4 factors, which all had salient loadings of $> .40$. Item communalities generally ranged from .65 to .80, and all communalities were greater than .60. Based on item content, the scales were labeled Social/Recreation, Performance, Conformity, and Self-Medication. Data reduction procedures were used to reduce the list of items, first by dropping any item that loaded on more than one factor. Based on these criteria, 43 items were retained. The item list was further reduced to five per subscale, using factor loadings and nonredundancy of item content as primary criteria. For example, the items with the top two factor loadings were retained for the second factor (performance motives). The third item "to help you study" was not retained as it was judged to be redundant with the second item "to perform better on school work or on tests." The fourth item "to help you concentrate" was also not retained as it was judged to be redundant with the first item "to help focus." Therefore, the item with the fifth highest factor loading, "because it helps to increase your alertness" was retained as the fourth item on this scale. The sixth item "to stay awake" was not retained as it was judged to be redundant with the fifth item "because it helps to increase your alertness." The seventh item "to help you stay organized" was then retained as the fifth item on this scale. The final NMPD Motives Questionnaire included 20 items across four factors (see Table 4).

The 20-items of the reduced NMPD Motives Questionnaire were examined using a PCA to verify that the four-dimensional structure of the measure was retained. Preliminary analyses were assessed to determine suitability of data for factor analysis. The Kaiser-Meyer-Olkin value of the reduced scale was .91, exceeding the recommended value of .6 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance ($p < .001$), again supporting the factorability of the correlation matrix. Consistent with initial findings, the PCA of the 20-item measure resulted in four components (eigenvalues > 1) that accounted for 75.4% of the total variance (see Table 4). All subsequent analyses will be conducted using the 20-item NMPD Motives Questionnaire.

Internal Consistency. Internal consistency was assessed using Cronbach's alpha for the overall 20-item NMPD Motives Questionnaire and each of the four factors. Overall, the NMPD Motives Questionnaire total score demonstrated excellent internal consistency ($\alpha = .91$). Each of the four motive subscales also demonstrated good to excellent internal consistencies: Social/Recreation ($\alpha = .93$), Performance ($\alpha = .93$), Conformity ($\alpha = .90$), and Self-Medication ($\alpha = .89$).

Convergent and discriminant validity. Pearson correlations were conducted to evaluate convergent and discriminant validity of the NMPD Motives Questionnaire subscales (see Table 6). Specifically, NMPD social/recreation motives demonstrated a large positive correlation with the DUDIT-E positive scale ($p < .001$) and a medium positive correlation with enhancement drinking motives ($p < .001$). NMPD social/recreation motives demonstrated small positive correlations with social drinking motives ($p < .001$), coping drinking motives ($p < .001$), and conformity drinking motives ($p < .001$), novelty sensation seeking ($p < .01$), intensity

sensation seeking ($p < .01$), and negative affect ($p < .001$). Interestingly, NMPD social/recreation motives were not correlated with positive affect ($p = .07$).

NMPD performance motives demonstrated medium positive correlations with social drinking motives ($p < .001$) and the DUDIT-E positive scale ($p < .001$). NMPD performance motives demonstrated small positive correlations with coping drinking motives ($p < .001$), enhancement drinking motives ($p < .001$), and conformity drinking motives ($p < .001$), as well as, positive affect ($p < .01$), and negative affect ($p < .01$). NMPD performance motives were not correlated with novelty sensation seeking ($p = .10$) and intensity sensation seeking ($p = .06$).

NMPD conformity motives demonstrated medium positive correlations with conformity drinking motives ($p < .001$), negative affect ($p < .001$), and the DUDIT-E positive scale ($p < .001$). NMPD conformity motives demonstrated small positive correlations with social drinking motives ($p < .05$), coping drinking motives ($p < .001$), and enhancement drinking motives ($p < .01$); as well as, positive affect ($p < .05$). NMPD conformity motives were not correlated with novelty sensation seeking ($p = .76$) and intensity sensation seeking ($p = .45$).

Finally, NMPD self-medication motives demonstrated a large positive correlation with the DUDIT-E positive scale ($p < .001$), and medium positive correlations with coping drinking motives ($p < .001$) and negative affect ($p < .001$). In addition, NMPD self-medication motives demonstrated small positive correlations with social drinking motives ($p < .01$), enhancement drinking motives ($p < .001$), and conformity drinking motives ($p < .001$). NMPD self-medication motives were not correlated with positive affect ($p = .37$), novelty sensation seeking ($p = .13$), and intensity sensation seeking ($p = .24$).

NMPD Type and NMPD Motives. Pearson correlations were also conducted to examine the relationship between NMPD type and NMPD motives (see Table 7). NMPD

social/recreation motives demonstrated a strong positive correlation with lifetime opioid use ($p < .001$) and moderate positive correlations with lifetime nonmedical stimulant use ($p < .001$) and nonmedical tranquilizer use ($p < .001$). In addition, social/recreation motives demonstrated small positive correlations with lifetime nonmedical sedative use ($p < .001$).

NMPD performance motives demonstrated a strong positive correlation with lifetime nonmedical stimulant use ($p < .001$). In addition, NMPD demonstrated small positive correlations with lifetime nonmedical sedative use ($p < .05$) and nonmedical tranquilizer use ($p < .001$). Of note, performance motives for NMPD use were not associated with lifetime nonmedical opioid use ($p = .53$).

NMPD conformity motives demonstrated small positive correlations with lifetime nonmedical opioid use ($p < .001$), nonmedical stimulant use ($p < .01$), nonmedical sedative use ($p < .001$), and nonmedical tranquilizer use ($p < .001$).

Lastly, NMPD self-medication motives demonstrated moderate positive correlations with lifetime nonmedical opioid use ($p < .001$), nonmedical sedative use ($p < .001$), and nonmedical tranquilizer use ($p < .001$). In addition, self-medication motives demonstrated small positive correlations with lifetime nonmedical stimulant use ($p < .001$).

Demographics and NMPD Motives. For the following analyses, gender was entered as a dichotomous variable (man = 0, woman = 1) to facilitate interpretation. Analysis of Variance (ANOVA) results indicate social/recreation motives for NMPD use was significantly higher among men ($M = 2.31$, $SD = 1.23$) compared to women ($M = 1.97$, $SD = 1.21$), $F(1,418) = 7.82$, $p < .01$. NMPD social/recreation motives, conformity motives, and self-medication motives were all significantly positively associated with age. No racial/ethnicity differences were found across NMPD motives.

Concurrent and Incremental Validity. NMPD social/recreation motives demonstrated a strong positive correlation with lifetime NMPD use ($p < .001$) and moderate positive correlations with NMPD problems ($p < .001$). In addition, social/recreation motives for NMPD use demonstrated small to moderate correlations with recent licit and illicit substance use (see Table 8 for details). Interestingly, social/recreation motives for NMPD use were not associated with lifetime alcohol use, $t(392) = -1.64, p = .10$; however, social/recreation motives for NMPD use were significantly correlated with frequency of alcohol use in the past 6-month alcohol use frequency ($p < .01$).

NMPD performance motives demonstrated a moderate positive correlation with NMPD use ($p < .001$). In addition, performance motives for NMPD use demonstrated small positive correlations with NMPD problems ($p < .01$), past 6-month alcohol use ($p < .001$), and recent licit and illicit substance use (see Table 8 for details). Of note, performance motives for NMPD use were not associated with lifetime alcohol use, $t(386) = -1.37, p = .17$.

NMPD conformity motives demonstrated small positive correlations with NMPD use ($p < .001$), NMPD problems ($p < .01$), and recent licit and illicit substance use (see Table 8 for details). Of note, conformity motives for NMPD use were not associated with lifetime, $t(393) = 1.58, p = .12$ or past 6-month alcohol use ($p = .42$).

Lastly, NMPD self-medication motives demonstrated moderate positive correlations with NMPD problems ($p < .001$) and NMPD use ($p < .001$). In addition, self-medication motives for NMPD use demonstrated small positive correlations other licit and illicit substance use (see Table 8 for details). Self-medication motives for NMPD use were not associated with lifetime alcohol use, $t(387) = -0.01, p = .99$; however, were significantly correlated with past 6-month alcohol use ($p < .05$).

Hierarchical regression analyses (see Table 9) were used to assess the ability of the NMPD motives to predict NMPD use, after controlling for the influence of age, gender, race, and frequency of other substance use. Age, gender, race, and frequency of other substance use were entered at Step 1, explaining 35% of the variance in NMPD use. After entry of the four NMPD motive subscales at Step 2, the total variance explained by the model as a whole was 46.5%, $F(13,386) = 25.86, p < .001$. The four NMPD motives explained an additional 11.7% of the variance in NMPD use, after controlling for age, gender, race, and frequency of other substance use, $R^2\Delta = .117, F\Delta(4, 386) = 21.10, p < .001$. In the final model, three covariates remained significant: age ($b = .150, t = 3.91, p < .001$), cigarette use ($b = .121, t = 2.68, p < .01$), and cocaine use ($b = .280, t = 5.13, p < .001$). The strongest predictor of NMPD use was social/recreation motives ($b = .268, t = 4.71, p < .001$), followed by performance motives, ($b = .178, t = 4.42, p < .001$), and self-medication motives ($b = .107, t = 1.98, p < .05$). Conformity motives did not make a unique statistically significant contribution to the final model $b = -.024, t = -.52, p = .61$).

Next, a second hierarchical regression analysis (see Table 10) was conducted to examine NMPD-related problems as a function of motives after accounting for NMPD use and other covariates (e.g., age, gender, and race). Age, gender, race, and NMPD use were entered at Step 1, explaining 27.2% of the variance in NMPD-related problems. After entry of the four NMPD motive subscales at Step 2, the total variance explained by the model as a whole was 34%, $F(8,225) = 14.47, p < .001$. The four NMPD motives explained an additional 6.8% of the variance in NMPD use, after controlling for age, gender, race, and NMPD use, $R^2\Delta = .068, F\Delta(4, 225) = 5.77, p < .001$. In the final model, NMPD use remained the strongest predictor of NMPD-related problems ($b = .374, t = 5.44, p < .001$). In addition, when controlling for use, self-

medication motives predicted NMPD-related problems ($b = .256, t = 3.32, p < .001$). No other NMPD motive made a unique statistically significant contribution to the final model; namely: social/recreation motives ($b = .065, t = .81, p = .42$), performance motives ($b = .000, t = -.01, p = .99$), and conformity motives ($b = -.004, t = -.07, p = .95$).

Discussion

Nonmedical prescription drug use is one of the fastest growing drug problems in the United States, with emerging adults reporting the highest prevalence rates (SAMHSA, 2014). While the current literature examining NMPD use has provided some important insight into the epidemic, a better understanding of the psychological factors (e.g., motives) influencing the decision to initiate and continue engaging in NMPD use is critical for prevention and intervention efforts. Previous research examining NMPD motives has been largely qualitative in nature and thus limited in terms of the psychometric properties needed for quantitative research. As such, the present study aimed to extend previous research on motives for NMPD use by developing and validating the “Nonmedical Prescription Drug Motives Questionnaire.”

The current study describes the development and preliminary evidence for the reliability and validity of a comprehensive NMPD motives measure. The 55-items of the initial iteration of the measure revealed a four-factor model of NMPD motives; including: social/recreation (e.g., to enhance social outcomes or positive affect), performance (e.g., to produce favorable performance outcomes or enhance productivity), conformity (e.g., to avoid rejection or encourage acceptance by peers), and self-medication (e.g., to mitigate negative affect or physical problems). Using factor loadings and nonredundancy of item content, the measure was reduced to include 5-items per subscale which is similar to the length of other motives measures in the literature (e.g.,

DMQ-R). Importantly, the reduced 20-item scale maintained the overall four-factor solution. As such, the 20-item NMPD Motives Questionnaire was used for all primary analyses.

Internal consistency for the overall scale and each of the four subscales ranged from good to excellent and demonstrated strong convergent, discriminant, and concurrent validity. The overall pattern of findings was generally consistent with the study's theoretically driven hypotheses for each NMPD motive. Supporting convergent validity, social/recreation and performance motives (i.e., motives driven by positive reinforcement) were more strongly related to drug use motives (assessed by the DUDIT-E positive scale), enhancement drinking motives, and social drinking motives. In addition, both social/recreation and performance motives demonstrated only small associations with conformity drinking motives, coping drinking motives, and negative affect. Alternatively, conformity and self-medication motives (i.e., motives driven by negative reinforcement) were more strongly related to conformity drinking motives, coping drinking motives, negative affect, and drug use motives (assessed by the DUDIT-E positive scale). In addition, conformity and self-medication motives demonstrated only small associations with social drinking motives and enhancement drinking motives, and were not related to sensation seeking.

Interestingly, social/recreation NMPD motives demonstrated a stronger association with enhancement drinking motives and small positive associations with social drinking motives, novelty sensation seeking, and intensity sensation seeking. Moreover, social/recreation motives were not related to positive affect. This finding is inconsistent with previous research (e.g., Cooper, 1994) as well as the thematic nature of the subscale (e.g., to increase positive affect or to enhance social experiences). Performance motives, on the other hand, demonstrated a stronger association with social drinking motives, and small positive associations with enhancement

drinking motives, and positive affect. As expected, performance motives were not associated with novelty or intensity sensation seeking. Notably, within the current study positive affect was associated with enhancement drinking motives but not associated with social drinking motives. It is unclear why positive affect is not associated with social motives for substance use within the current sample; however, this finding may point to the complexity of NMPD use given the current sample is restricted to individuals reporting lifetime NMPD use.

An examination of the relation between NMPD type and NMPD motives provided additional support of convergent and discriminate validity. Social/recreation motives demonstrated a strong relation with lifetime opioid, stimulant, and tranquilizer use, as well as a small relation with lifetime sedative use. As expected, performance motives demonstrated a strong association with lifetime stimulant use and small associations with lifetime sedative and tranquilizer use. Moreover, performance motives were not associated with lifetime opioid use. One possible explanation for this finding is that students may be engaging in NMPD use to improve performance on a task by 1) increasing their focus/alertness (i.e., stimulant use) and/or 2) reducing general distress for the purpose of being more productive (i.e., sedative use and tranquilizer use). This finding is generally consistent with results reported by Rozenbroek and Rothstein (2011) in which 54% of stimulant users and 22% of depressant users reported academic motives (e.g., performance-related motives) as their primary reason for use, while only 4% of opioid users reported academic motives. A small association was found between conformity motives and each of the four types of NMPD use. Given that conformity motives are conceptualized as being driven by negative reinforcement from an external source, no differences were expected based on NMPD type. Finally, self-medication motives were moderately associated with opioid, tranquilizer, and sedative use. A small association was found

between self-medication and stimulant use. Again, this is consistent with the study's theoretically driven hypotheses. Self-medication motives are conceptualized as being driven by negative reinforcement from an internal source. As such, opioids, tranquilizers, and sedatives were expected to demonstrate stronger relations (compared to stimulants) with self-medication motives given the pharmacological purpose of these drug types.

Concurrent validity was supported for the NMPD Motives Questionnaire based upon an examination of the relations between NMPD motives and NMPD use and NMPD-related problems. Specifically, social/recreation, performance, and self-medication motives were associated with a high frequency of NMPD use. In addition, social/recreation and self-medication motives demonstrated a strong relation with NMPD-related problems, while performance and conformity motives only demonstrated a small linkage to NMPD-related problems. As expected, all NMPD motives were generally associated with past 6-month licit (i.e., alcohol, tobacco) and illicit (i.e., marijuana, cocaine, hallucinogen, ecstasy) substance use. In fact, one of the most consistent correlates of NMPD use among both adolescents and emerging adults is the use of alcohol and other drugs (Arria, Caldeira, Vincent, O'Grady, & Wish, 2008; Barrett et al., 2005; McLarnon, Barrett, Monaghan, & Stewart, 2012). Consistent with previous research examining substance use motives (Cooper, 1994; Patrick, Lee, & Larimer, 2011; Simons et al., 2000), conformity motives for NMPD use demonstrated small associations with NMPD use and problems.

In support of incremental validity, additional analyses revealed that NMPD motives are useful constructs for understanding both NMPD use and NMPD-related problems. Specifically, NMPD motives contributed unique variance (12%) to the prediction of NMPD use after accounting for the influence of age, gender, race, and frequency of other substance use.

Social/recreation, performance, and self-medication motives were significant positive predictors of NMPD use, with social/recreation motives being the strongest of the three. Conformity motives were not a unique predictor of NMPD use. Finally, NMPD motives also contributed unique variance (7%) to the prediction of NMPD-related problems after accounting for the influence of age, gender, race, and NMPD use. As expected, NMPD use remained the strongest predictor of NMPD-related problems. However, after accounting for NMPD use, self-medication motives remained a significant positive predictor of NMPD-related problems. As such, individuals reporting self-medication motives for NMPD use may be at an increased risk of experiencing NMPD-related problems, compared to those who report social/recreation, performance, or conformity motives. This finding is consistent with the drinking motives literature where coping motives have consistently been associated with alcohol problems (e.g., Cooper, 1994; Cooper et al, 1995; Kuntsche, Knibbe, Gmel, & Engels, 2005; Simons et al, 2000). In addition, this finding is also consistent with the NMPD use literature where self-medication motives (e.g., to get away from my problems or troubles) have been associated with substance-related problems (e.g., Boyd et al., 2006; McCabe et al., 2007).

Consistent with Cox and Klinger's motivational model of substance use, data from the current study also generally support two underlying dimensions (i.e., valence and source) across motives for NMPD use. Specifically, negative reinforcement motives (conformity and self-medication) share several characteristics that distinguish them from positive reinforcement motives, such as relation to negative affect, coping drinking motives, and conformity drinking motives. Of note, it was originally hypothesized that performance motives would be captured within a broader self-medication category and be driven by negative reinforcement from an internal source. The current findings suggest that performance motives are better explained by

positive reinforcement (e.g., to produce favorable performance outcomes or enhance productivity) than negative reinforcement (e.g., to reduce inattention). This is further supported by shared characteristics with other positive reinforcement motives, such as positive affect, enhancement drinking motives, and social drinking motives.

When considering the second dimension (internal versus external source), data from the current study highlights some of the complexities of NMPD use. As expected, data from the current study supports the conceptualization of NMPD motives driven by negative reinforcement as coming from different sources, namely: conformity motives (external source) and self-medication motives (internal source). Interestingly, NMPD motives driven by positive reinforcement (i.e., social/recreation and performance) appear to reflect a mix of internal and external sources of reinforcement. For example, social/recreation motives include items such as: “because it gives you a pleasant feeling” (internal source) and “because it improves parties or celebrations” (external source). Similarly, performance motives include items such as: “to help focus” (internal source) and “to perform better on school work and tests” (external source). One possible explanation for these motives to include mixed sources may be related to the differing pharmacological effects based on the type of NMPD. Another possible explanation relates to the fact that a distinct social factor did not emerge within the factor structure. In fact, the majority of items included in the social/recreation subscale reflect enhancement-related motives (e.g. “to get high”) rather than social-related motives (e.g., “to be sociable”). Moreover, the enhancement-related items demonstrated higher item loadings compared to the social-related items (see Table 4). This finding may suggest that NMPD use is a less “social” behavior compared to drinking or substance use. This may be attributed to the fact that taking a pill happens quickly while

drinking or smoking marijuana might take place over a longer period of time with other people.

Strengths, Limitations, and Future Directions

The present study has several important strengths which should be noted. First, a large sample ($N = 423$) of emerging adult NMPD users were successfully recruited from a broader study of college student substance use behaviors and attitudes. Evidence suggests that sample sizes of at least 300 participants are generally sufficient for ensuring stability and replicability of factor analyses (Clark & Watson, 1995; Tabachnick, Fidell & Osterlind, 2001; Worthington & Whittaker, 2006). As such, the current study exceeded the target number of participants (i.e., 300) to ensure adequate power. Second, this is the first known study to develop a psychometrically sound measure of NMPD motives. Two previous studies have developed measures to examine motives for opioid use (i.e., Opioid Prescription Medication Motives Questionnaire; Jones, Spradlin, Robinson, & Tragesser, 2014) and expectancies related to stimulant use (i.e., Prescription Stimulant Expectancy Questionnaire; Looby & Earlywine, 2009); however, these measures are limited to specific drug types. As such, the NMPD Motives Questionnaire provides a psychometrically sound instrument that is able to capture motives across all four NMPD types (opioids, stimulants, sedatives, and tranquilizers) and provides a common language for researchers who seek to examine specific motive dimensions related to the use of NMPDs. Of note, the items in the aforementioned measures were not considered in the development of the current NMPD Motives Questionnaire. One measure (i.e., the Opioid Prescription Medication Motives Questionnaire) was developed after the current study started and the other measure (i.e., the Prescription Stimulant Expectancy Questionnaire) was not identified until after the current measure was developed. A comparison of the developed scales suggest similarities between these measures and the NMPD Motives Questionnaire.

Specifically, the Prescription Stimulant Expectancy Questionnaire includes items that target both positive and negative expectancies for nonmedical stimulant use across several general domains, including focus (e.g., “I can focus very well”, “I focus on unimportant tasks”), school performance (e.g., “I learn very efficiently”, “I feel like I’m cutting corners to do well”), and physiological responses (e.g., “It’s no trouble to sit still”, “I feel twitchy”). These domains were also captured in the development of the motives measure in the present study (e.g., “to help focus” and “to perform better on school work or tests”). Similarly, the Opioid Prescription Medication Motives Questionnaire was based upon previous prescription opioid motives literature (e.g., Boyd et al., 2006; Lord et al., 2011; McCabe et al., 2007), which were also considered for the current item generation. Jones and colleagues (2014) reported a four-factor model of the measure, including social (e.g., “because it improves parties or celebrations”), enhancement (e.g., “to get high”), coping (e.g., “to forget about your problems”), and pain (e.g., “to relieve physical pain”). Again, similar items were included in the development of the motives measure in the present study. Therefore, while these measures were not considered during the initial item generation for the current study, an examination of items suggest overarching similarities in the motives and expectancies identified. As such, the NMPD Motives Questionnaire is judged to reflect the current state of the NMPD motives literature. Finally, the present study has important utility and implications for both clinical and research domains. The NMPD Motives Questionnaire is a theoretically-based, brief, and reliable measure of NMPD motives that demonstrates preliminary evidence of sound construct validity.

Within the current study, there are also a few limitations that should be considered. First, while the study demonstrated the NMPD Motives Questionnaire exhibits good construct validity, it should be noted that predictive validity and test-retest reliability were not examined. Future

studies should include additional tests of validity and reliability to provide further support of the psychometric properties of this instrument. For example, future studies may further assess the validity of this measure by examining the strength of the association between motives and diagnosis of an NMPD use disorder. In addition, this was a preliminary study which appropriately utilized an exploratory factor analyses. Future studies should explore the psychometric properties of the NMPD Motives questionnaire using confirmatory factor analyses within an independent sample.

Second, the generalizability of the current results is limited given the majority of the sample identified as women (62%) and either White non-Hispanic (53%) or White Hispanic (28%). As such, additional research is needed to understand the degree to which the current results generalize to other populations. Future research should attempt to examine the NMPD Motives Questionnaire in a more diverse sample. Additionally, data analyses did not examine or control for potential differences based on data collection site. Importantly, site differences can lead to misinterpretation of results due to systematic bias within the data and thus increase the possibility of Type II error. Follow-up examination of the data revealed some notable site differences. Specifically, participants reporting lifetime NMPD use at the University of Arkansas ($n = 241$; $M_{\text{age}} = 19.3$; 56% women) were younger, more likely to report NMPD performance motives and social drinking motives compared to participants at the University of North Texas. Further, participants at the University of North Texas ($n = 182$; $M_{\text{age}} = 20.8$; 70% women) were significantly older, more likely to report NMPD social/recreation motives, NMPD self-medication motives, and present moment negative affect compared to individuals at the University of Arkansas. Although not presented in the present document, follow-up analyses controlling for data collection site were conducted and revealed the same pattern of results.

Third, the study is limited in that it is based on self-report data among college students in a cross-sectional design. Given the self-report nature, the sample could have inaccurately portrayed their motives for NMPD use or actual NMPD use behaviors. Moreover, the cross-sectional design utilized is not able to address issues of directionality or developmental change over time. Longitudinal studies are necessary in order to better understand the trends in motives and correlates of NMPD use among emerging adult samples. In addition, while college-based samples are an important population to examine regarding substance use behaviors, findings should be interpreted with caution before generalizing to the larger population (Tanner, 2006).

Fourth, the current study included a sample of individuals who reported any lifetime NMPD use. Previous studies have suggested that individuals who endorse three or more occasions of NMPD use in the past month are less likely to report experimental use and consequently more likely to demonstrate drug-use related problems (McCabe & Teter, 2007). Given the aim of the current study, a restricted sample would limit the generalizability of the findings. College has been identified as a high-risk time for the initiation of substance use behaviors that develop into more problematic use over time (McCabe et al., 2007; SAMHSA, 2014). As such, the inclusion of individuals who have used NMPD one or two times is important to better understand the full spectrum of use from initiation to more problem use.

Fifth, an experimenter error was made in the questionnaire administered to students at one of the data collection sites, resulting in incomplete data from this site related to NMPD problems. Consequently, all analyses that included the Short Inventory of Problems – PDM were limited to data collected at the University of Arkansas ($n = 241$). Also, positive and negative affect were assessed at the present moment rather than over the past 6-months or longer timeframe. This experimenter error limited the study's ability to examine the relation between

substance use motives and affect, given the moment the individual completed the study is likely unrepresentative of his/her general affective state. Finally, novelty and intensity sensation seeking were measured using a modified set of items rather than the original AISS scale. While this decision increased reliability of this measure in the current study, it also limited the ability for direct comparison with other studies related to sensation seeking.

Conclusions

The current study extends previous research on motives for NMPD use by developing and validating a comprehensive NMPD motives measure. As NMPD use continues to rise, it is important that both researchers and clinicians are better able to not only identify this high-risk population but also provide support and services that map on to the complex presentation that these individuals are likely to experience. Similar to other substance use motives (Cooper, 1994; Cooper, Russell, Skinner, & Windle, 1992; Simons et al., 1998), results of the current study suggest that individuals engage in NMPD use for a variety of reasons. As such, a better understanding of NMPD motives is necessary in order to gain insight into NMPD use behavior and its consequences. Taken together, results of this study support the NMPD Motives Questionnaire as a potentially psychometrically sound instrument for measuring motives for NMPD use.

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Table 1. *Demographic Summary*

	Total Sample (<i>N</i> = 1,427)	NMPD Use Sample (<i>n</i> = 423)
Age (<i>M</i>, <i>SD</i>)	19.83 (<i>SD</i> = 1.71)	19.94 (<i>SD</i> = 1.75)
Gender		
Female	934 (65.5%)	262 (61.9%)
Male	492 (34.5%)	161 (38.1%)
Race/Ethnicity		
White Non-Hispanic	678 (48.5%)	224 (53.0%)
White Hispanic	366 (26.2%)	120 (28.4%)
African American / Black	149 (10.7%)	28 (6.6%)
Hispanic/Latino (non-White)	63 (4.5%)	19 (4.5%)
Asian, American Indian, Pacific Islander	110 (7.8%)	20 (4.7%)
Other	31 (2.2%)	8 (1.9%)
Year in College		
Freshman	613 (43.0%)	168 (39.7%)
Sophomore	364 (25.5%)	112 (26.5%)
Junior	278 (19.5%)	90 (21.3%)
Senior	171 (12.0%)	53 (12.5%)
Marital Status		
Single/Never Married	1,405 (98.5%)	416 (98.3%)
Married	16 (1.1%)	6 (1.4%)
Separated	2 (0.1%)	0 (0.0%)
Divorced	1 (0.1%)	0 (0.0%)
Living Conditions		
Residence Hall	655 (45.9%)	168 (39.7%)
Apartment	491 (34.4%)	159 (37.6%)
Greek Housing	36 (2.5%)	20 (4.7%)
Own Home	56 (3.9%)	22 (5.2%)
With Parents/Family	159 (11.1%)	48 (11.3%)
Other	7 (0.5%)	4 (0.9%)

Employment

Unemployed	836 (58.6%)	235 (55.6%)
Part-time (1-20 hrs/week)	374 (26.2%)	105 (24.8%)
Part-time (20-30 hrs/week)	160 (11.2%)	63 (14.9%)
Full-time	52 (3.6%)	18 (4.3%)

Note. NMPD = Nonmedical Prescription Drug

Table 2. *Lifetime and Past 6-month NMPD use by drug type (N = 423)*

	Lifetime NMPD use	Past 6-month NMPD use
Opioids		
Never	150 (35.6%)	Never 279 (66.4%)
1-3 times	132 (31.4%)	Less than monthly 106 (25.2%)
4-6 times	36 (8.5%)	Monthly 19 (4.5%)
7-10 times	41 (9.7%)	Weekly 11 (2.6%)
11-20 times	24 (5.7%)	Daily/Almost Daily 5 (1.2%)
21-40 times	19 (4.5%)	
41+ times	19 (4.5%)	
Stimulants		
Never	111 (26.3%)	Never 203 (48.2%)
1-3 times	110 (26.1%)	Less than monthly 133 (31.6%)
4-6 times	55 (13.0%)	Monthly 59 (14.0%)
7-10 times	55 (13.0%)	Weekly 22 (5.2%)
11-20 times	41 (9.7%)	Daily/Almost Daily 4 (1.0%)
21-40 times	25 (5.9%)	
41+ times	25 (5.9%)	
Sedatives		
Never	283 (67.5%)	Never 359 (85.3%)
1-3 times	73 (17.4%)	Less than monthly 47 (11.2%)
4-6 times	23 (5.5%)	Monthly 12 (2.9%)
7-10 times	18 (4.3%)	Weekly 2 (0.5%)
11-20 times	12 (2.9%)	Daily/Almost Daily 1 (0.2%)
21-40 times	7 (1.7%)	
41+ times	3 (0.7%)	
Tranquilizers		
Never	271 (64.4%)	Never 347 (82.4%)
1-3 times	66 (15.7%)	Less than monthly 49 (11.6%)
4-6 times	24 (5.7%)	Monthly 17 (4.0%)
7-10 times	19 (4.5%)	Weekly 6 (1.4%)
11-20 times	15 (3.6%)	Daily/Almost Daily 2 (0.5%)
21-40 times	17 (4.0%)	
41+ times	9 (2.1%)	

Note. NMPD = Nonmedical Prescription Drug

Table 3. *Principle Components Analysis of the 55-item NMPD Motives Questionnaire: Oblimin Rotated Factor Loadings (Pattern Matrix) for Motives in the NMPD Use Sample (N = 423)*

	Factor 1: Social/ Recreation	Factor 2: Performance	Factor 3: Conformity	Factor 4: Self- Medication
Eigenvalues	24.43	5.82	3.62	2.61
Variance explained (%)	44.42	10.58	6.58	4.75
Chronbach's alpha	0.97	0.94	0.92	0.95
<i>NMPD Motives Questionnaire item content</i>				
18. Because it's fun	.925			
11. Because it makes social gatherings more fun	.899			
14. Because it improves parties and celebrations	.889			
16. To celebrate a special occasion with friends	.844			
10. To get high	.831			
13. Because it gives you a pleasant feeling	.824			
9. Because it's exciting	.798			
7. Because you like the feeling	.790			
3. Because it helps you enjoy a party	.787			
5. To be sociable	.764			
25. To be more open to experiences	.726			
26. Because you want to alter your perspective	.679			
15. Because you feel more self-confident and sure of yourself	.607			
47. To relieve boredom	.601			
33. To take my high to the next level	.596			
48. To stay out and party longer	.594			
41. Because you had nothing better to do	.587		.317	
23. To understand things differently	.569			
22. Because it helps me be more creative and original	.527			
36. Because it makes you more comfortable in an unfamiliar situation	.507			
24. To expand my awareness	.500	.387		
55. To allow you to think differently	.437			
21. To know myself better	.393		.348	
45. To help focus		.930		

39. To perform better on school work or on tests		.920	
44. To help you study		.918	
30. To help you concentrate		.925	
40. Because it helps to increase your alertness		.851	
32. To be more efficient		.846	
51. To stay awake		.769	
38. To help you stay organized		.761	
34. To feel more energetic	.365	.483	
8. So that others won't kid you about not doing it			.944
49. Because you didn't want to be the only one not doing it			.872
20. So you won't feel left out			.822
19. To be liked			.783
2. Because your friends pressure you to use them			.755
50. Because it counteracts the effects of other drugs			.720
42. To avoid withdrawal from alcohol or other drugs			.707
12. To fit in with the group you like			.664
31. To lose weight			.534
52. To reduce fatigue during exercise	.314	.462	
46. To suppress your appetite	.346	.379	
29. To manage pain			.848
43. To help you sleep			.792
37. Because it relieves your pain			.787
54. Because you are having problems sleeping			.769
4. Because it helps you when you feel depressed or nervous			.731
35. To escape from your life			.722
27. To calm down			.717
17. To forget about your problems			.671
28. Because it helps you deal with stress			.661
1. To forget your worries			.652
6. To cheer up when you are in a bad mood	.399		.536
53. Because it helps make napping easier and enjoyable			.424

Note. NMPD = Nonmedical Prescription Drug

Table 4. *Principle Components Analysis of the 20-item NMPD Motives Questionnaire: Oblimin Rotated Factor Loadings (Pattern Matrix) for Motives in the NMPD Use Sample (N = 423)*

	Factor 1: Social/ Recreation	Factor 2: Performance	Factor 3: Conformity	Factor 4: Self- Medication
Eigenvalues	8.15	3.39	2.24	1.30
Variance explained (%)	40.75	16.97	11.19	6.47
Chronbach's alpha	0.93	0.93	0.90	0.89
<i>NMPD Motives Questionnaire item content</i>				
18. Because it's fun	.903			
10. To get high	.865			
13. Because it gives you a pleasant feeling	.856			
14. Because it improves parties and celebrations	.846			
5. To be sociable	.754			
39. To perform better on school work or on tests		.939		
45. To help focus		.910		
40. Because it helps to increase your alertness		.887		
32. To be more efficient		.862		
38. To help you stay organized		.798		
8. So that others won't kid you about not doing it			.939	
49. Because you didn't want to be the only one not doing it			.899	
2. Because your friends pressure you to use them			.816	
19. To be liked			.760	
50. Because it counteracts the effects of other drugs			.725	
29. To manage pain				.865
43. To help you sleep				.783
35. To escape from your life				.744
4. Because it helps you when you feel depressed or nervous				.706
17. To forget about your problems				.700

Note. NMPD = Nonmedical Prescription Drug

Table 5. *Principle Components Analysis of the Arnett Inventory of Sensation Seeking: Varimax Rotated Factor Loadings (N = 423)*

	Factor 1: Novelty	Factor 2: Intensity
Eigenvalues	2.57	1.50
Variance explained (%)	23.38	13.58
Chronbach's alpha	0.60	0.52
<i>AISS item content</i>		
9. I would like to travel to places that are strange and far away	.732	
1. I can see how it would be interesting to marry someone from a foreign country	.648	
11. I would have enjoyed being one of the first explorers of an unknown land	.594	.370
19. If it were possible to visit another planet or the moon for free, I would be among the first in line to sign up	.530	.410
17. I think it's best to order something familiar when eating in a restaurant	.443	
5. When I am taking a trip, I think it is best to make as few plans as possible and just take it as it comes	.407	
20. I can see how it must be exciting to be in a battle during war		.727
16. It would be interesting to see a car accident happen		.649
12. I like a movie where there are a lot of explosions and car chases		.562
18. I like the feeling of standing next to the edge on a high place and looking down	.361	.489
8. If I were to go to an amusement park, I would prefer to ride the rollercoaster or other fast rides		.316

Note. AISS = Arnett Inventory of Sensation Seeking

Table 6. *Correlation Matrix*

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. NMPD - Social/Rec	2.10	1.23	--													
2. NMPD -Performance	2.35	1.33	.21**	--												
3. NMPD - Conformity	1.23	0.58	.44**	.24**	--											
4. NMPD - Self-Med	1.86	1.05	.66**	.24**	.50**	--										
5. DMQ- Social	3.32	1.04	.26**	.30**	.11*	.16**	--									
6. DMQ- Coping	2.26	0.96	.26**	.22**	.26**	.44**	.51**	--								
7. DMQ- Enhancement	2.99	1.05	.34**	.26**	.15**	.23**	.72**	.54**	--							
8. DMQ- Conformity	1.59	0.78	.18**	.17**	.44**	.28**	.36**	.49**	.29**	--						
9. DUDIT-E - positive	23.78	16.65	.55**	.30**	.31**	.55**	.24**	.39**	.29**	.25**	--					
10. Positive Affect	23.71	8.68	.09	.12*	.09	.05	.09	.06	.17**	.12*	.16**	--				
11. Negative Affect	15.81	6.88	.14**	.14**	.29**	.32**	.61	.32**	.11*	.22**	.27**	.10	--			
12. Novelty SS	27.44	4.05	.13**	.08	.02	.08	-.02	-.04	.06	-.01	.25**	.08	.02	--		
13. Intensity SS	27.17	4.09	.14**	.09	.04	.06	.09	.01	.16**	.02	.13*	.11	-.03	.31**	--	
14. Age	19.94	1.75	.14**	-.02	.11*	.16**	-.03	.01	-.01	.05	.04	.08	.03	.04	-.08	--

Note. * $p < .05$, ** $p < .01$. NMPD = Nonmedical Prescription Drug, NMPD-Social/Rec = Social/Recreation motives, NMPD – Self-Med = NMPD Self-Medication, SS = Sensation Seeking.

Table 7. Correlation Matrix (N = 423)

	1	2	3	4	5	6	7	8	9	10	11
1. NMPD - Social/Rec	--										
2. NMPD -Performance	.21**	--									
3. NMPD - Conformity	.44**	.23**	--								
4. NMPD - Self-Med	.66**	.24**	.47**	--							
5. Lifetime NMPD opioid use	.51**	.02	.18**	.41**	--						
6. Lifetime NMPD stimulant use	.32**	.55**	.14*	.15**	.26**	--					
7. Lifetime NMPD sedative use	.27**	.14*	.24**	.32**	.37**	.27**	--				
8. Lifetime NMPD tranquilizer use	.49**	.16**	.26**	.38**	.52**	.38**	.36**	--			
9. Age	.14**	-.02	.11*	.16**	.21**	.01	.11*	.22**	--		
10. Gender (0 = men, 1 = women)	-.14**	-.04	-.07	.00	-.14*	-.11*	-.05	-.10*	.02	--	
11. Race (0 = non-white, 1 = white)	-.03	.10*	-.02	-.10*	-.05	.13*	.01	.05	-.06	-.10*	--

Note. * $p < .05$, ** $p < .01$. NMPD = Nonmedical Prescription Drug, NMPD-Social/Rec = Social/Recreation motives, NMPD – Self-Med = NMPD Self-Medication.

Table 8. *Correlation Matrix (N = 423)*

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. NMPD - Social/Rec	2.10	1.23	--											
2. NMPD -Performance	2.35	1.33	.21**	--										
3. NMPD - Conformity	1.23	0.58	.44**	.23**	--									
4. NMPD - Self-Med	1.86	1.05	.66**	.24**	.47**	--								
5. NMPD Use	4.96	4.54	.56**	.32**	.28**	.43**	--							
6. NMPD Problems ^a	1.35	2.43	.44**	.20**	.26**	.45**	.52**	--						
7. Past 6-month Alcohol use	3.29	0.95	.17**	.17**	.05	.12*	.17**	.13*	--					
8. Past 6-month Tobacco use	2.16	1.39	.39**	.09	.05	.24**	.37**	.18**	.25**	--				
9. Past 6-month Marijuana use	2.52	1.50	.46**	.24**	.11*	.31**	.40**	.18**	.24**	.40**	--			
10. Past 6-month Cocaine use	1.13	0.42	.40**	.18**	.26**	.20**	.48**	.30**	.24**	.33**	.35**	--		
11. Past 6-month Hallucinogen use	1.23	0.51	.39**	.23**	.20**	.30**	.37**	.24**	.14**	.38**	.52**	.51**	--	
12. Past 6-month Ecstasy use	1.12	0.41	.32**	.22**	.31**	.22**	.36**	.27**	.19**	.20**	.31**	.67**	.56**	--

Note. * $p < .05$, ** $p < .01$. NMPD = Nonmedical Prescription Drug, NMPD-Social/Rec = Social/Recreation, NMPD – Self-Med = NMPD Self-Medication. ^a $n = 241$, due to an experimenter error made in the questionnaire administered to students at the University of North Texas data collection site, all analyses that included this measure (i.e., Short Inventory of Problems – Prescription Drug Misuse) were limited to data collected at the University of Arkansas. Lifetime heroin, methamphetamine, and PCP use were not included in analyses because of low rates of use ($n < 5$).

Table 9. *Hierarchical Linear Regression Predicting Lifetime Nonmedical Prescription Drug Use from NMPD Motives.*

	B	SE	beta	<i>t</i>	<i>p</i>
Block 1					
Age	.508	.11	.196	4.75	< .001
Gender (0 = men, 1 = women)	.021	.41	.002	.05	.96
Race (0 = non-white, 1 = white)	.200	.50	.017	.403	.69
Past 6-month Alcohol Use	-.089	.21	-.019	-.423	.67
Past 6-month Cigarette Use	.575	.16	.175	3.65	< .001
Past 6-month Marijuana Use	.575	.15	.190	3.76	< .001
Past 6-month Cocaine Use	3.48	.63	.326	5.57	< .001
Past 6-month Hallucinogen Use	.335	.51	.038	.657	.51
Past 6-month Ecstasy Use	.161	.66	.015	.243	.81
Block 2					
NMPD – Social/Recreation Motives	.988	.21	.268	4.71	< .001
NMPD – Performance Motives	.605	.14	.178	4.42	< .001
NMPD – Conformity Motives	-.187	.36	-.024	-.516	.61
NMPD – Self-medication Motives	.462	.23	.107	1.98	< .05

Note. NMPD = Nonmedical Prescription Drug. Lifetime heroin, methamphetamine, and PCP use were not included as covarites in this analysis because of low rates of use ($n < 5$)

Table 10. *Hierarchical Linear Regression Predicting Nonmedical Prescription Drug Use Problems from NMPD Motives.*

	B	SE	beta	<i>t</i>	<i>p</i>
Block 1					
Age	.021	.08	.015	.263	.79
Gender (0 = men, 1 = women)	.106	.29	.021	.371	.71
Race (0 = non-white, 1 = white)	.273	.36	.043	.760	.45
NMPD use	.277	.03	.517	8.90	< .001
Block 2					
NMPD – Social/Recreation Motives	.128	.16	.065	.811	.42
NMPD – Performance Motives	-.001	.11	.000	-.005	.99
NMPD – Conformity Motives	-.018	.27	-.004	-.068	.95
NMPD – Self-medication Motives	.590	.18	.256	3.32	< .001

Note. NMPD = Nonmedical Prescription Drug

NMPD Motives Questionnaire

Below is a list of reasons people sometimes give for nonmedical prescription drug use. Thinking 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. To forget your worries	1	2	3	4	5
2. Because your friends pressure you to use them	1	2	3	4	5
3. Because it helps you enjoy a party	1	2	3	4	5
4. Because it helps you when you feel depressed or nervous	1	2	3	4	5
5. To be sociable	1	2	3	4	5
6. To cheer up when you are in a bad mood	1	2	3	4	5
7. Because you like the feeling	1	2	3	4	5
8. So that others won't kid you about not doing it	1	2	3	4	5
9. Because it's exciting	1	2	3	4	5
10. To get high	1	2	3	4	5
11. Because it makes social gatherings more fun	1	2	3	4	5
12. To fit in with a group you like	1	2	3	4	5
13. Because it gives you a pleasant feeling	1	2	3	4	5
14. Because it improves parties and celebrations	1	2	3	4	5
15. Because you feel more self-confident and sure of yourself	1	2	3	4	5

16. To celebrate a special occasion with friends	1	2	3	4	5
17. To forget about your problems	1	2	3	4	5
18. Because it's fun	1	2	3	4	5
19. To be liked	1	2	3	4	5
20. So you won't feel left out	1	2	3	4	5
21. To know myself better	1	2	3	4	5
22. Because it helps me be more creative and original	1	2	3	4	5
23. To understand things differently	1	2	3	4	5
24. To expand my awareness	1	2	3	4	5
25. To be more open to experiences	1	2	3	4	5
26. Because you want to alter your perspective	1	2	3	4	5
27. To calm down	1	2	3	4	5
28. Because it helps you deal with stress	1	2	3	4	5
29. To manage pain	1	2	3	4	5
30. To help you concentrate	1	2	3	4	5
31. To lose weight	1	2	3	4	5
32. To be more efficient	1	2	3	4	5
33. To take my high to the next level	1	2	3	4	5
34. To feel more energetic	1	2	3	4	5
35. To escape from your life	1	2	3	4	5

36. Because it makes you more comfortable in an unfamiliar situation	1	2	3	4	5
37. Because it relieves your pain	1	2	3	4	5
38. To help you stay organized	1	2	3	4	5
39. To perform better on school work or on tests	1	2	3	4	5
40. Because it helps to increase your alertness	1	2	3	4	5
41. Because you had nothing better to do	1	2	3	4	5
42. To avoid withdrawal from alcohol or other drugs	1	2	3	4	5
43. To help you sleep	1	2	3	4	5
44. To help you study	1	2	3	4	5
45. To help focus	1	2	3	4	5
46. To suppress your appetite	1	2	3	4	5
47. To relieve boredom	1	2	3	4	5
48. To stay out and party longer	1	2	3	4	5
49. Because you didn't want to be the only one not doing it	1	2	3	4	5
50. Because it counteracts the effects of other drugs	1	2	3	4	5
51. To stay awake	1	2	3	4	5
52. To reduce fatigue during exercise	1	2	3	4	5
53. Because it helps make napping easier and enjoyable	1	2	3	4	5
54. Because you are having problems sleeping	1	2	3	4	5
55. To allow yourself to think differently	1	2	3	4	5

Drinking Motives Questionnaire-Revised

Below is a list of reasons people sometimes give for drinking alcohol. Thinking about all of the times you drink, how often would you say that you drink for each of the following reasons?

	Almost Never /Never	Some of the Time	Half of the Time	Most of the Time	Almost Always/ Always
1. To forget your worries	1	2	3	4	5
2. Because your friends pressure you to drink	1	2	3	4	5
3. Because it helps you enjoy a party	1	2	3	4	5
4. Because it helps you when you feel depressed or nervous	1	2	3	4	5
5. To be sociable	1	2	3	4	5
6. To cheer up when you are in a bad mood	1	2	3	4	5
7. Because you like the feeling	1	2	3	4	5
8. So that others won't kid you about not drinking	1	2	3	4	5
9. Because it's exciting	1	2	3	4	5
10. To get high, buzzed, or drunk	1	2	3	4	5
11. Because it makes social gatherings more fun	1	2	3	4	5
12. To fit in with a group you like	1	2	3	4	5
13. Because it gives you a pleasant feeling	1	2	3	4	5
14. Because it improves parties and celebrations	1	2	3	4	5
15. Because you feel more self-confident and sure of yourself	1	2	3	4	5
16. To celebrate a special occasion with friends	1	2	3	4	5
17. To forget about your problems	1	2	3	4	5
18. Because it's fun	1	2	3	4	5
19. To be liked	1	2	3	4	5
20. So you won't feel left out.	1	2	3	4	5

Drug Use Disorders Identification Test – Extended

What is positive for you about using drugs?

	Not at all	A little	Somewhat	A lot	Totally
1. Sleep better	1	2	3	4	5
2. Lose tension and become relaxed	1	2	3	4	5
3. Become happy	1	2	3	4	5
4. Become strong	1	2	3	4	5
5. Feel “normal”	1	2	3	4	5
6. Become creative (get ideas, do artistic things)	1	2	3	4	5
7. Become active (clean home, do dishes, wash car, etc.)	1	2	3	4	5
8. Love everybody and the whole world	1	2	3	4	5
9. More self-confidence	1	2	3	4	5
10. Feel less pain in my back, neck, head, etc.	1	2	3	4	5
11. Get a feeling that everything will work out	1	2	3	4	5
12. Life without drugs is boring	1	2	3	4	5
13. Because it gives you a pleasant feeling	1	2	3	4	5
14. I can control feelings like anxiety, anger, and depression	1	2	3	4	5
15. With drugs I feel that I am part of the group	1	2	3	4	5
16. I get better contact with others	1	2	3	4	5
17. I get more out of my life	1	2	3	4	5

Nonmedical Prescription Drug Use

1. *Have you ever used a prescription drug that was not prescribed to you, or used it in ways for which it was not prescribed?*
 - a. Yes
 - b. No

2. *On how many occasions in your **lifetime** have you used the following types of prescription drugs for nonmedical purposes or in ways other than prescribed?*

	Never	1-3 times	4-6 times	7-10 times	11-20 times	21-40 times	41 or more times
Pain medication (e.g., opioids such as Vicodin®, OxyContin®, Tylenol 3® with codeine, Percocet®, Darvocet®, morphine, hydrocodone, and oxycodone)							
Stimulant medication (e.g., Ritalin®, Dexedrine®, Adderall®, Concerta®, methlyphenidate)							
Sleep medication (e.g., Ambien®, Halcion®, Restoril®, temazepam, and triazolam)							
Sedative/Anxiety medication (e.g., Ativan®, Xanax®, Valium®, Klonopin®, diazepam, and lorazepam)							
More than one of these prescription drugs at the same time (e.g., mixing two or more types of prescription drugs)							

3. On how many occasions in the **past 6-months** have you used the following types of prescription drugs for nonmedical purposes or in ways other than prescribed?

	Never	Less than monthly	Monthly	Weekly	Daily/ Almost Daily
Pain medication (e.g., opioids such as Vicodin®, OxyContin®, Tylenol 3® with codeine, Percocet®, Darvocet®, morphine, hydrocodone, and oxycodone)					
Stimulant medication (e.g., Ritalin®, Dexedrine®, Adderall®, Concerta®, methlyphenidate)					
Sleep medication (e.g., Ambien®, Halcion®, Restoril®, temazepam, and triazolam)					
Sedative/Anxiety medication (e.g., Ativan®, Xanax®, Valium®, Klonopin®, diazepam, and lorazepam)					
More than one of these prescription drugs at the same time (e.g., mixing two or more types of prescription drugs)					

4. How old were you when you first started using [NMPD type]? _____
5. When you use [NMPD type], which of the following ways do you use it?
 - a. Orally
 - b. Snorting
 - c. Smoking
 - d. Injecting
 - e. Inhaling
6. In which situation do you most often take [NMPD] for nonmedical purposes?
 - a. With a friend or acquaintance
 - b. With a family member or other relative
 - c. By yourself
7. Have you ever consumed alcohol while experiencing the effects of a prescription drug mentioned previously (i.e., pain medication, stimulant medication, sleep medication, or sedative/anxiety medication)?
 - a. Yes
 - b. No
8. How often in the past 6-months have you used a prescription drug (i.e., pain medication, stimulant medication, sleep medication, or sedative/anxiety medication) and alcohol at the same time?
 - a. Never
 - b. Sometimes
 - c. Often
 - d. Always

Short Inventory of Problems – Prescription Drug Misuse

Here are a number of events that people sometimes experience. Read each one carefully, and circle the number that indicates whether this has EVER happened to you (0 = No, 1 = Yes). If an item does not apply to you, circle zero (0).

Has this <u>EVER</u> happened to you? Circle one answer:	No	Yes
1. I have been unhappy because of my prescription drug misuse.	0	1
2. Because of my prescription drug misuse, I have not eaten properly.	0	1
3. I have failed to do what is expected of me because of my prescription drug misuse.	0	1
4. I have felt guilty or ashamed because of my prescription drug misuse.	0	1
5. I have taken foolish risks when I have misused prescription drugs.	0	1
6. When misusing prescription drugs, I have done impulsive things that I regretted later.	0	1
7. My physical health has been harmed by my prescription drug misuse.	0	1
8. I have had money problems because of my prescription drug misuse.	0	1
9. My physical appearance has been harmed by my prescription drug misuse.	0	1
10. My family has been hurt by my prescription drug misuse.	0	1
11. A friendship or close relationship has been damaged by my prescription drug misuse.	0	1
12. My prescription drug misuse has gotten in the way of my growth as a person.	0	1
13. My prescription drug misuse has damaged my social life, popularity, or reputation.	0	1
14. I have spent too much or lost a lot of money because of my prescription drug misuse.	0	1
15. I have had an accident while experiencing the effects of a prescription drug.	0	1

Positive and Negative Affect Schedule

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

1	2	3	4	5
very slightly	a little	moderately	quite a bit	extremely

___ interested

___ irritable

___ distressed

___ alert

___ excited

___ ashamed

___ upset

___ inspired

___ strong

___ nervous

___ guilty

___ determined

___ scared

___ attentive

___ hostile

___ jittery

___ enthusiastic

___ active

___ proud

___ afraid

Substance Use Questionnaire

Please indicate how many days you have used each of the following substances in the **past 6 months**. Also, please indicate if you have **EVER** used the substance in your lifetime. (CHECK THE APPROPRIATE BOX FOR EACH QUESTION.)

How often did you use this substance in the **PAST 6 MONTHS**?

Have you **EVER** used this substance in your lifetime?

	<u>Never</u>	<u>Less than monthly</u>	<u>Monthly</u>	<u>Weekly</u>	<u>Daily/ Almost daily</u>	<u>Yes</u>	<u>No</u>
a. Alcohol	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>
b. Caffeine (coffee, tea, caffeinated cola, etc.)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>
c. Cigarettes or other tobacco	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>
d. Marijuana, hashish (pot, grass)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>
e. Cocaine (coke, crack, rock)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>
f. Heroin	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>
g. Methamphetamine (crank, meth, ice)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>
h. Hallucinogens (LSD, mescaline, peyote, mushrooms, psilocybin, etc.)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>
i. PCP (angel dust) or Ketamine (“K”)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>
j. Ecstasy (X), GHB (Liquid X), or Rohypnol (roofie)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>

Arnett Inventory of Sensation Seeking

For each item, indicate which response best applies to you.

1. I can see how it would be interesting to marry someone from a foreign country.
 - (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all

2. When the water is very cold, I prefer not to swim even if it is a hot day.
 - (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all

3. If I have to wait in a long line, I'm usually patient about it.
 - (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all

4. When I listen to music, I like it to be loud.
 - (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all

5. When I am taking a trip, I think it is best to make as few plans as possible and just take it as it comes.
 - (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all

6. I stay away from movies that are said to be frightening or highly suspenseful.
 - (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all

7. I think it's fun and exciting to perform or speak before a group.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
8. If I were to go to an amusement park, I would prefer to ride the rollercoaster or other fast rides.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
9. I would like to travel to places that are strange and far away.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
10. I would never like to gamble with money, even if I could afford it.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
11. I would have enjoyed being one of the first explorers of an unknown land.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
12. I like a movie where there are a lot of explosions and car chases.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
13. I don't like extremely hot and spicy foods.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all

14. In general, I work better when I'm under pressure.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
15. I often like to have the TV or radio on while I'm doing something else, such as reading or cleaning up.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
16. It would be interesting to see a car accident happen.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
17. I think it's best to order something familiar when eating in a restaurant.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
18. I like the feeling of standing next to the edge on a high place and looking down.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
19. If it were possible to visit another planet or the moon for free, I would be among the first in line to sign up.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all
20. I can see how it must be exciting to be in a battle during a war.
- (A) describes me very well
 - (B) describes me somewhat
 - (C) does not describe me very well
 - (D) does not describe me at all



March 6, 2015

MEMORANDUM

TO: Lauren Milner
Lindsay Ham

FROM: Ro Windwalker
IRB Coordinator

RE: PROJECT CONTINUATION

IRB Protocol #: 14-02-516

Protocol Title: *Motives for Substance Use Behaviors Survey*

Review Type: EXEMPT EXPEDITED FULL IRB

Previous Approval Period: Start Date: 02/27/2014 Expiration Date: 02/26/2015

New Expiration Date: 02/26/2016

Your request to extend the referenced protocol has been approved by the IRB. If at the end of this period you wish to continue the project, you must submit a request using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. Failure to obtain approval for a continuation on or prior to this new expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

This protocol has been approved for 1,000 total participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.