



# Examining the link between nonmedical use of sedatives, tranquilizers, and pain relievers with dispositions toward impulsivity among college students



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## HIGHLIGHTS

- Impulsive trait-nonmedical depressant use relations vary by depressant type.
- Dispositions toward impulsivity differentially relate to depressant use by gender.
- Lumping of depressant substances should be avoided in future research.

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## ABSTRACT

**Background:** The association between impulsive dispositions and the use of the central nervous system (CNS) depressant alcohol has been examined extensively; however, the links between other depressant use (sedatives, tranquilizers, and pain relievers) and impulsivity have been less studied, and findings have been equivocal. This may be due, in part, to varying operationalizations of “impulsivity,” as well as issues related to the lumping versus splitting of various depressant substances when assessing use. The effect of gender on the impulsivity-depressant use relation has also yielded mixed results and remains understudied. The current study sought to determine whether lumping versus splitting of depressant substances and distinct impulsivity-related dispositions, as well as participant gender, impact the depressant-impulsivity relation.

**Method:** Participants were 778 undergraduate students (72% female, 80% White, 23% Hispanic), who completed a battery of self-report assessments online, including the UPPS-P.

**Results:** Hierarchical linear models indicated that specific impulsive dispositions differentiated between users and non-users of specific depressant substances, and these relations varied by gender. For example, sensation seeking significantly differentiated between users and non-users of pain relievers for females only, whereas sensation seeking differentiated between users and non-users of tranquilizers among males but not females.

**Conclusions:** In addition to informing substance use research practices by providing evidence that lumping of depressant substances leads to loss of vital information, as well as demonstrating nuanced gender differences, findings can also inform screening and personality-targeted treatment practices.

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## 1. Introduction

In the United States, emerging adults (i.e., 18–25 year olds; Arnett, 2000) are more likely to engage in nonmedical prescription drug use in comparison to any other age group, and three of the most frequently abused prescription types (i.e., tranquilizers, sedatives, opioids; Center for Behavioral Health Statistics and Quality [CBHSQ], 2015) are central

nervous system depressants (Jann, Kennedy, & Lopez, 2014). Past-year prevalence of nonmedical depressant use (NMDU) among emerging adults are 2.8%, 1.2%, and 0.2%, for pain relievers, tranquilizers, and sedatives, respectively, and NMDU is linked to multiple odious outcomes within this population. In addition to potentiating risk of substance use disorders, NMDU is associated with multiple negative consequences, including academic impairment (i.e., analgesics and

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stimulants; Arria, O'Grady, Caldeira, Vincent, & Wish, 2008b), increased frequency of risky automobile-related behaviors (i.e., NMDU and stimulants; Laz, Shemontee, Rahman, & Berenson, 2013), transitioning to heroin use (particularly among opioid users; Cicero, Ellis, Surratt, & Kurtz, 2014), and unintended overdose (see Jann et al., 2014). Recent data indicate that overdose rates are increasing (Centers for Disease Control and Prevention [CDC], 2016), with most deaths attributed to ingestion of opioid analgesics (Hall et al., 2008), followed by benzodiazepines (a type of tranquilizer; Jann et al., 2014).

Although some research suggests that males are more prone to NMDU (McCabe, West, Teter, & Boyd, 2014) and development of disordered use (Back, Payne, Simpson, & Brady, 2010), emerging evidence suggests the gender gap in NMDU and depressant overdose is narrowing (CDC WONDER, 2016), with female rates exceeding male rates of use in some samples (Hall, Howard, & McCabe, 2010; Kokkevi, Fotiou, Arapaki, & Richardson, 2008). Women are also more likely to exhibit a rapid transition from initial-to-disordered use (i.e., telescoping; Greenfield, Back, Lawson, & Brady, 2010). This phenomenon has been observed with sedatives, tranquilizers, and pain relievers (Hernandez-Avila, Rounsaville, & Kranzler, 2004; Kandel, Warner, & Kessler, 1998). Given these observations, more research attention to gender-based predictors of NMDU is warranted.

### 1.1. NMDU and impulsivity

Although specific personality traits appear to increase the likelihood of substance misuse generally (see Littlefield & Sher, 2016), traits related to the construct of "impulsivity" (or related constructs, such as sensation seeking) seem especially relevant to substance use behaviors, including NMDU. Regarding gender differences, research findings in impulsivity-related dispositions have been equivocal (Perry & Carroll, 2008), with some suggesting that males exhibit higher (Zuckerman, Eysenck, & Eysenck, 1978), lower (Reynolds, Ortengren, Richards, & de Wit, 2006) or equivalent levels of traits reflecting impulsivity in comparison to females (Fillmore & Weafer, 2004). Mixed findings may be due, in part, to various operationalizations and assessments of *impulsivity*, an idiomatic term used to describe multiple characteristics (Sharma, Kohl, Morgan, & Clark, 2013).

In recognition of this problem, the UPPS-P assesses five distinct dispositions toward impulsivity: negative urgency (NU; tendency to act rashly when experiencing negative emotion), positive urgency (PU; tendency to act rashly when experiencing positive emotion), lack of planning (LPlan; tendency to act without planning or careful thinking), lack of perseverance (LPer; inability to remain on task until completion), and sensation seeking (SS; tendency to pursue exciting, risky activities; Lynam, Smith, Whiteside, & Cyders, 2006; Whiteside & Lynam, 2001; Whiteside, Lynam, Miller, & Reynolds, 2005), and has accrued empirical evidence in support of its construct validity. Measurement invariance testing demonstrated that the UPPS-P is invariant across gender, and that males, compared to females, reported significantly higher levels of PU and SS (Cyders, 2013). Thus, research supports significant gender differences regarding mean-levels of impulsivity-like traits that may relate to NMDU. Previous research examining the impulsivity-NMDU relation found that sensation seeking (as measured by Zuckerman-Kuhlman Personality Questionnaire–Short version; Zuckerman, 2002) was associated with greater likelihood of nonmedical prescription anxiolytic use, including tranquilizers (operationalized as binary past-year use; Arria, Caldeira, Vincent, O'Grady, & Wish, 2008a), among undergraduates, adjusting for gender. Among young adults from the general population, both sensation seeking and impulsivity (as measured by the Substance Use Risk Profile Scale; Woicik, Stewart, Pihl, & Conrod, 2009) were associated with anxiolytic and sedative prescription misuse (operationalized as binary abuse and dependence criteria; McLarnon, Monaghan, Stewart, & Barrett, 2011), though no gender effects were tested. Unfortunately, many studies do not examine gender-interaction effects and may simply adjust model

estimates based on gender. Further, various impulsive dispositions are largely underexplored in terms of their relation to NMDU.

### 1.2. NMDU, impulsivity, and gender

Although studies have sought to better understand the impulsivity-substance use relation, many do not consider gender effects (e.g., Berg, Latzman, Bliwise, & Lilienfeld, 2015; McLarnon et al., 2011), whereas others adjust for participant gender or test gender interactions (Arria et al., 2008a; Verdejo-García, Bechara, Recknor, & Pérez-García, 2007). All UPPS-P dispositions have been associated with illicit substance use among college students (including misuse of prescription drugs) when adjusting for gender (Zapolski, Cyders, & Smith, 2009). Shin, Chung, and Jeon (2013) found that, when adjusting estimates for gender, SS and LPlan were predictive of past-year illicit substance use, whereas urgency (i.e., scores reflecting NU) was not. However, NU has been linked to illicit substance use among college students, though gender effects were not examined beyond rates of use (Kaiser, Milich, Lynam, & Charnigo, 2012). Thus, few studies have examined the role of gender in the relation between impulsivity and illicit substance use, broadly defined (let alone NMDU), and even fewer have examined gender-by-impulsivity interactions.

Just as "lumping" various impulsivity-related constructs together can impede scientific progress (Cyders, 2015; Smith, McCarthy, & Zapolski, 2009), the lumping of illicit substances, including depressants, into one category may be a suboptimal scientific practice (though pragmatic when using smaller samples). Indeed, evidence suggests that personality traits may differentially relate to substance use as a function of the type of substance under consideration (Littlefield & Sher, 2016; Terracciano, Löckenhoff, Crum, Bienvenu, & Costa, 2008). Unfortunately, the tendency to "lump vs. split" in the substance use-personality literature varies considerably, with little consensus on "best practice" approaches.

### 1.3. Rationale for the current study

Although some evidence points to gender differences in impulsivity and use of specific depressant substances, other research findings do not support this. Because equivocal evidence may be due to varying operationalizations of impulsivity and NMDU (i.e., lumping versus splitting of impulsivity, as well as illicit substances), the current study has three aims: (1) determine whether gender differences exist in prevalence of NMDU and impulsive-disposition scores, (2) investigate whether these NMDU-impulsivity relations are moderated by gender via planned contrasts, and (3) determine whether lumping, versus splitting, of depressant substances when testing specific relations with impulsive dispositions yields different conclusions.

## 2. Materials and methods

### 2.1. Participants

Participants ( $N = 778$ ; identified as 72% female; 80% White; 10% Black; 4% Asian; 23% Hispanic; 81% exclusively heterosexual;  $M$  age = 19.84,  $SD = 1.67$  [age range = 18–25]; 38% freshmen) consisted of undergraduate students from a large, southwestern university. Participants completed self-report measures via an online survey. All procedures and measures were approved by the university's Institutional Review Board. Participants received course credit for their participation.

### 2.2. Measures

#### 2.2.1. Dispositions toward impulsivity

The UPPS-P Impulsive Behavior Scale (UPPS-P) is composed of 59 items, which assess five impulsive dispositions (NU, PU, SS, LPlan, and LPer). Items were measured on a four-point scale ('strongly agree' to

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