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Influences of Motivational Contexts on Prescription Drug Misuse and Related Drug Problems

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Abstract

Prescription drug misuse has emerged as a significant problem among young adults. While the effects of motivational contexts have been demonstrated for illicit drugs, the role of motivational contexts in prescription drug misuse remains understudied. Using data from 400 young adults recruited via time-space sampling, we examined the role of motivational contexts in the frequency of misuse of three prescription drug types as well as drug-related problems and symptoms of dependency. Both negative and positive motivations to use drugs are associated with increases in prescription drug misuse frequency. Only negative motivations are associated directly with drug problems and drug dependence, as well as indirectly via prescription pain killer misuse. Addressing positive and negative motivational contexts of prescription drug misuse may not only provide a means to reduce misuse and implement harm reduction measures, but may also inform the content of treatment plans for young adults with prescription drug misuse problems.

1. Introduction

Prescription drug misuse has emerged as a significant problem during the 21st century; this trend has been particularly prevalent among young adults (Kelly et al., 2013; McCabe et al. 2006). In 2012, over 4.7 million American young adults reported the misuse of prescription drugs during the past year (SAMHSA, 2013). Furthermore, the lifetime prevalence of

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prescription drug misuse among young adults is greater than that for most illegal drugs; only marijuana continues to be more widely used than prescription drugs among young people (SAMHSA, 2013). Further, while the overall prescription drug trend has plateaued in the United States, misuse remains a significant problem among American young adults, and recently it has become a more significant global drug trend (UNODC, 2011).

Prescription drug misuse has not only emerged as a significant drug trend, but has created substantial problems for the health care sector and drug treatment facilities. Studies suggest that a range of negative health effects are associated with prescription drug misuse, including cognitive impairment, mental health problems, overdose, and organ damage (Caplan et al., 2007; Teter et al., 2010). Prescription drug misuse burdens the health care system as well. Between 2004 and 2008, the number of emergency room visits involving the misuse of prescription drugs increased 81%; for prescription pain killers specifically, the increase was 111%, or more than double the number of visits (SAMHSA, 2011). The misuse of prescription drugs accounted for a large proportion of all drug-related emergency room visits (SAMHSA, 2011). Increased rates of prescription drug misuse have also contributed heavily to the treatment burden in the United States in recent years. Prescription drug misuse is among the most common problems for young people enrolled in drug treatment (Gonzales et al., 2011). There are also major economic impacts; prescription opioid abuse alone costs the United States tens of billions of dollars (Birnbaum et al., 2011). Thus, the problems associated with prescription drug misuse are significant, making research into the motivations associated with misuse imperative to guide prevention and intervention programs.

1.1 The Role of Motivational Contexts in Drug Use

There are a variety of motivations underlying substance use. Young people, in particular, have been shown to express a wide range of motivations for substance use, including relaxation, intoxication, staying alert while socializing, and alleviating negative affect (Boys et al., 2001), and these wide ranging motivations among young people extend to prescription drug misuse (Boyd et al., 2006; McCabe et al., 2009). Such motivational contexts have proven to be important influences of patterns of drug use in a variety of ways (Hartwell et al., 2012; Starks et al., 2010). For example, the desire to use drugs to deal with conflicts with others is associated with greater frequency of drug use (Halkitis et al., 2003). The growth of an individual's drug use trajectory over time is associated with the motivation of using drugs to have pleasant times with others (Palamar et al., 2008). Additionally, unpleasant emotions have been identified as a motivational context related to polydrug use among young adults (Kelly & Parsons, 2008). Scholars have also shown that motivations are important in the reduction or cessation of substance use. For example, feeling motivated to use drugs due to social pressures has been associated with heroin relapse (El Sheikh & Bashir, 2004). Collectively, numerous studies demonstrate the role of a range of motivational contexts in patterns of substance use, particularly that certain motivations are tied to increasing frequency of substance use. Yet, the role of motivational contexts in abuse and dependence related to prescription drug misuse remains understudied.

Motivational contexts also have implications for both identifying the potential for problem use as well as the consideration of drug treatment options (Turner, Annis, & Sklar, 1997). If particular motivations can be tied to problem patterns of drug use, researchers and practitioners can identify high risk situations for drug users, and intervention or harm reduction efforts can focus on these motivational contexts as part of the approach. Similarly, if these motivations can be linked with symptoms of drug dependence, they will facilitate tailored interventions as well as the identification of treatment modalities that best serve clients with certain motivational profiles. Furthermore, motivational contexts are particularly important when it comes to relapse of substance abuse (Marlatt & Friedman, 1981), and thus will enable the identification of key relapse prevention measures among individuals with past substance abuse problems.

1.2 Current Study

Given the significance of prescription drug misuse and the treatment and care burden it has generated, we aim to understand how motivational contexts influence patterns of prescription drug misuse and related problems. Specifically, we examine the influence of motivational contexts on the frequency of prescription drug misuse, drug related problems, and symptoms of dependence among young adults active in nightlife scenes. We will consider that greater scores on motivational contexts will directly influence greater frequency of misuse of all prescription drug types as well as prescription drug related problems and symptoms of dependency. We also posit that greater scores on these motivational contexts indirectly influence prescription drug related problems and symptoms of dependency via the frequency of prescription drug misuse. The identification of these pathways allows us to determine the motivational contexts that most influence prescription drug misuse and its associated problems. Such an assessment may facilitate prevention, treatment, and harm reduction efforts.

2. Methods

2.1 Sampling and Procedures

To generate the sample for this study, we primarily utilized time-space sampling in a wide range of venues that house nightlife scenes in New York City (NYC). Time-space sampling was originally developed to capture hard-to-reach populations (MacKellar et al., 1996; Muhib et al., 2001; Stueve et al., 2001), but is also constructive for generating samples of venue-based populations (Parsons et al., 2008). As young adults active in nightlife scenes can be considered a venue-based population, we used venues as our basic unit of sampling in order to systematically generate a sample of socially active young adults. We captured a range of variability among these young adults through randomizing 1) the venues attended and 2) the days and times we sampled individuals from them.

We randomized “time” and “space” using a sampling frame of venues and times of operation. To construct the sampling frame, ethnographic fieldwork conducted over the previous twelve months enabled the assessment of “socially viable” venues for each day of the week. A venue was deemed socially viable if a threshold of young adult patron traffic existed at the venue on that given day of the week. We generated lists of socially viable

venues for each day of the week across several key youth cultures – e.g. electronic dance music (EDM), gay clubs, lesbian parties, and indie rock scenes. The venues included bars, clubs, lounges, warehouses, loft spaces, and performance venues. Recruitment occurred year round with teams of recruiters. For all days of the week, all viable venues were listed and assigned a number. Using a random digit generator, a random number was drawn corresponding to a particular venue on a particular day. Ultimately, this process yielded our schedule of venues for each month.

Once at the venue, project staff attempted to screen as many individuals as possible, aiming to survey all young adults at the venue. Staff approached a patron, identified themselves, described the screening survey, and requested verbal consent for participation in the anonymous brief survey conducted on an iPod Touch® that was designed using iFormBuilder software. For those who provided consent to participate, the beginning of the brief surveys were administered by trained staff (age and NYC residency) and respondents self-reported all other information (race, sexual orientation, gender, and substance use) directly onto the iPod Touch®. Individuals received no compensation for completing the screening survey. Field staff members were trained not to administer surveys to individuals who were visibly impaired by intoxication to ensure the capacity to consent. Response rates to the screening survey (75.0%) were high given the difficult conditions of surveying young adults in nightclub settings and the lack of compensation for participating in the screening survey.

Upon completion of the survey, the software determined whether the individual was eligible for the study (9.4% of all those screened in venues were eligible). If participants were eligible, they were given a brief description of the study and asked to provide contact information if they were interested in participating. Later in the timeline of study enrollment, staff also provided eligible participants the opportunity to verify their age and identity at the point of recruitment so that the study survey could be completed online. A majority of those deemed eligible (77.4%) provided contact information for further study participation.

Near the end of the project, venue recruitment was supplemented by scene-targeted recruitment via online groups associated with nightlife scenes of interest. The research team first developed a list of groups that were relevant to each of the scenes of interest for the project. Group members who were between the ages of 18–29 and resided in the NYC metropolitan area saw an advertisement for the study; if they clicked on the advertisement, they were directed to a Qualtrics® survey that screened for study eligibility and, if eligible, collected their contact information. Less than 5% of the sample was recruited via this supplemental method.

Regardless of recruitment method (venue-based or online), research staff contacted participants by phone and e-mail to provide more information about the study, confirm eligibility, and schedule the initial assessment (or send them a link to the online survey if they showed proof of age in the field). Eligibility criteria were as follows: 1) Aged 18–29; 2) Report the misuse of prescription drugs at least three times in the past six months; and 3) Report the misuse of prescription drugs at least once in the past three months. The subjects could report any of three classes – many reported the misuse of multiple classes. A threshold

of 3 recent occasions of misuse excluded individuals who simply experimented with a single occasion of misuse while also avoided enrolling only heavy users. In the initial assessment, participants completed the informed consent process, then completed the survey (via ACASI for in-house assessments and via Qualtrics® for online assessments). Once completed, participants were compensated \$50 in cash, check, or Amazon.com gift card (depending on their preference). All procedures were reviewed and approved by the universities' Institutional Review Boards.

2.2 Measures

Demographics—Participants self-reported their age, gender, sexual identity (gay, straight, bisexual, queer, or questioning), race/ethnicity (White, Latino, Black, Asian/Pacific Islander, or mixed), highest education completed (some high school, high school diploma, some college, currently enrolled in college, 4-year college degree, or graduate school), parental socio-economic status (poor, working class, middle class, upper middle class, and wealthy), and employment status (full-time work, part-time work, part-time work/student, unemployed student, or unemployed-other).

Motivational Contexts—We use the Inventory of Drug Taking Situations (IDTS) to assess motivational contexts in which individuals misuse prescription drugs (Annis, Turner, & Sklar, 1996). The scale was modified to specifically focus on situations of prescription drug misuse. Subjects rated on a 5-point Likert-type scale from “Never” to “Always” how often they had misused prescription drugs in response to specific situations. For example, “In the past 3 months, I have used prescription drugs when I felt overwhelmed and wanted to escape.” Or... “when I wanted to celebrate.” The IDTS has eight subscales (unpleasant emotions, physical discomfort, conflict with others, social pressures to use, pleasant times with others, pleasant emotions, testing personal control, and urges/temptations). These subscales load onto three more general higher-order factors of Negative Situations (unpleasant emotions, physical discomfort, and conflict with others), Positive Situations (pleasant emotions, pleasant times with others), and Tempting Situations (urges/temptations, social pressures to use, tempting personal control). A confirmatory factor analysis revealed that this structure adequately fit the adapted scale (RMSEA = 0.06, CFI = 0.86, SRMR = 0.08). Scores for the three higher-order subscales were formed by averaging across the items from their corresponding lower-order factors, and each showed evidence of strong internal consistency (Negative Situations $\alpha = 0.96$, Positive Situations $\alpha = 0.90$, Tempting Situations $\alpha = 0.90$).

Prescription Drug Misuse—We used the following operational definition of prescription drug misuse, which was provided to subjects: “... using prescription drugs obtained from a non-medical source, using more than the prescribed dose, or using prescription drugs for a non-medical or recreational purpose. Non-medical use may occur whether you do or do not have a prescription for that drug.” Respondents reported their frequency of misuse (measured in days) during the previous three months of each of three distinct prescription drug types (pain killers, sedatives, and stimulants). Subjects were provided examples of each prescription drug class to facilitate clarity on the types of substances.

Drug Problems—We also assessed both symptoms of dependence and problems associated with drug use. The Composite International Diagnostic Interview (CIDI) Substance Abuse Module was tailored to assess symptoms of drug dependence related to prescription drug use (Cottler & Keating, 1990). This 8-item measure is an internationally recognized measure used to assess symptoms of prescription drug dependence. The Short Inventory of Problems with Alcohol and Drugs (SIP-AD) was also tailored to assess problems associated with the misuse of prescription drugs. The SIP-AD is a 15-item inventory of problems associated with substance use (Blanchard et al., 2003).

2.3 Statistical Analyses

We began by examining basic frequencies of sample characteristics, followed by demographic comparisons of the three higher order IDTS subscales (Negative Situations, Positive Situations, and Tempting Situations) using analysis of variance with least significant difference (LSD) post-hoc tests for those results with significant main effects. We also provide similar analyses for frequency of prescription drug misuse, drug problems, and dependence as outcomes; we performed Kruskal-Wallis and Mann-Whitney tests for the prescription drug frequencies and ANOVA with LSD post-hoc tests for the CIDI and SIP-AD. Following this, we utilized Mplus version 7.11 to conduct path analyses examining the structural associations among the IDTS subscales, frequency of misuse of each prescription drug type (pain killers, sedatives, and stimulants), and severity of substance use problems (the CIDI and SIP-AD). In doing so, we specified the three frequency of prescription drug misuse variables as negative binomial-distributed count variables using the Mplus default of robust maximum likelihood (MLR) estimation with Monte Carlo integration based on 500 dimensions of integration (Muthén, L.K. and Muthén, B.O. 1998–2012). Upon fitting the initially hypothesized model, we tested for mediation by allowing direct paths from the IDTS subscales to the CIDI and SIP-AD scores to be freely estimated. We retained all significant effects between IDTS and outcome variables (while dropping non-significant paths above marginal significance at $p=0.06$) and ran a final model testing for the significance of the indirect paths using the Model Constraint feature in Mplus. As a result of using MLR estimation, traditional fit indices (e.g., RMSEA, CFI/TLI, SRMR, chi-square statistic) and standardized model results were unavailable for the path models and are not reported within the results. Incident Rate Ratios (IRR) are reported for the negative binomial results (i.e., substance use frequency variables) in the text.

3. Results

The recruitment yielded 400 participants for the analyses contained in this paper, with a mean age of 24.5 years. As seen in Table 1, approximately one-third of members of the sample were racial/ethnic minorities. The sample was split relatively evenly with regard to gender and sexual orientation. Slightly more than half of the sample was single. More than half of the subjects had a 4-year college degree and nearly one-quarter grew up in a poor or working class family. We found significant differences between racial/ethnic groups in the Positive and Tempting Situations subscales; post-hoc analyses revealed that Latino participants were higher than White ($p < .01$) and other ($p < .001$) participants on the Positive Situations subscale and Black and Latino participants were significantly higher than

White ($p < .01$ in both cases) and other ($p < .05$ in both cases) participants on the Tempting Situations subscale. We found significant gender/sexual orientation differences in the Positive and Tempting Situations subscales, with heterosexual men scoring higher on both subscales than gay/bisexual/queer (GBQ) men ($p < .01$ for both subscales) and heterosexual women ($p < .001$ for both subscales) and LBQ women scoring higher than heterosexual women ($p < .05$ for both subscales). Finally, we found educational differences on the Negative and Tempting Situations subscales; those with a 4-year college degree scored lower on the Negative Situations subscale than those with only some college or a 2-year degree ($p < .001$), and those with a 4-year college degree scored lower on the Tempting Situations subscale than those with a high school diploma or less ($p < .01$), some college or a 2-year degree ($p < .05$), and those currently enrolled in college ($p < .05$).

As shown in Table 2, the median number of occasions of prescription drug misuse for pain killers, sedatives, and stimulants during the past 90 days was 3.0, 4.0, and 3.0 days, respectively. Mean SIP-AD score was 5.03 and mean CIDI score was 2.25. Significant racial/ethnic differences in pain killer use were found, with Latinos reporting higher frequency than White and Other/Multiracial participants ($p < .01$). No other differences were found for race/ethnicity. Educational differences existed for pain killer and sedative use frequency, CIDI score, and SIP-AD score. Those with high school education or less reported higher pain killer use than those currently in college or those with a 4-year degree, and those with some college or an associate's degree reported higher use than those with a 4-year degree ($p < .001$). Though there was a significant main effect of education on sedative use, no significant differences emerged in the adjusted post-hoc comparisons. Those with less education typically reported greater problems with substance use on both the SIP-AD and CIDI than those with more education ($p < .001$). We found no significant differences on any variables for gender/sexual orientation, relationship status, or parental socioeconomic status.

We next sought to examine the hypothesized model whereby Negative, Positive, and Tempting Situations lead to increases in the frequency of recent prescription pain killer, sedative, and stimulant misuse, which in turn leads to increased levels of substance use problems as measured with the CIDI and the SIP-AD. The results of this hypothesized model are displayed in Figure 1, with significant paths shown as solid lines and non-significant paths shown as dotted lines. The Negative Situations subscale was positively associated with the frequency of all three forms of prescription drug misuse. A one-unit increase in this subscale was associated with a 59% increase in the rate of pain killer misuse (IRR = 1.59, 95% CI [1.24, 1.95]) and a 60% increase in the rate of stimulant misuse (IRR = 1.60, 95% CI [1.23, 1.97]). Substantially higher in magnitude, a one unit increase in the Negative Situations subscale also increases the rate of sedative misuse by 2.7 times (IRR = 2.71, 95% CI [2.01, 3.42]). A one-unit increase in the Positive Situations subscale was significantly associated with a 28% increase in the rate of pain killer misuse (IRR = 1.35, 95% CI [1.00, 1.56]) and a marginally significant 29% increase in the rate of stimulant misuse (IRR = 1.29, 95% CI [0.95, 1.63]), but was not associated with sedative misuse. The Tempting Situations subscale was not associated with the frequency of misuse for any prescription drug measured. The frequency with which participants had misused prescription pain killers, sedatives, and stimulants during the prior 90 days were all significantly

associated with greater reported substance use problems measured on the CIDI and the SIP-AD. An increase of a single instance of pain killer misuse is associated with a 0.03 unit increase in CIDI severity and a 0.11 unit increase in SIP-AD severity. Similarly, a one-unit increase in sedative misuse frequency is associated with a 0.02 unit increase on the CIDI and a 0.07 unit increase on the SIP-AD. Finally, an additional instance of stimulant misuse has the same magnitude effect on each severity index as sedative misuse (0.02 on the CIDI and 0.07 on the SIP-AD). We note that the differing magnitude of frequency of misuse on the effect between the scales is reflective of the different ranges of the scales.

We next sought to examine the extent to which frequency of misuse mediated the association between the IDTS subscales and substance use problems by testing for direct effects of the IDTS subscales in predicting CIDI and SIP-AD scores. We estimated a model in which Negative, Positive, and Tempting Situations subscale scores had direct paths to CIDI and SIP-AD scores. In the final model displayed in Figure 2, we removed the non-significant direct effects of Positive and Tempting Situations on CIDI and SIP-AD scores. For clarity of the model, Figure 2 does not contain path coefficients for non-significant pathways. We found that the Negative Situations subscale was significantly and directly associated with both outcomes, increasing CIDI severity by 1.28 and SIP-AD severity by 5.33 per unit increase. As shown, the addition of direct effects from Negative Situations to CIDI and SIP-AD scores reduced the pathways from prescription sedative and stimulant misuse frequency to CIDI and SIP-AD scores to non-significance. In addition, the magnitude of pain killer misuse frequency on the SIP-AD is mediated, reducing it by half to 0.05, though it remains statistically significant as does the effect on the CIDI. We also tested for the significance of the indirect pathways from Negative and Positive Situations subscale scores to CIDI and SIP-AD scores through pain killer misuse frequency, the only mediator that retained significant direct effects on the outcomes. The tests revealed a positive indirect effect from the Negative Situations subscale on CIDI ($B = 0.01$, 95% CI [0.00, 0.01], $p = .05$) and marginally significant effect on SIP-AD ($B = 0.02$, 95% CI [0.00, 0.05], $p = .06$) scores, but non-significant effects for Positive Situations ($B = 0.00$, 95% CI [0.00, 0.01], $p = .16$ and $B = 0.01$, 95% CI [0.00, 0.03], $p = .14$, respectively). Taken together, these findings suggest that misusing substances as a result of Negative Situations leads to substance use problems both directly and through increases in the misuse of prescription pain killers.

4. Discussion

Prior studies indicate that the motivational contexts of substance use are important not only for determining patterns of substance use, but for influencing clinically-significant effects of drug use as well (Turner et al, 1997). Motivational contexts also have implications for clinicians with regard to the design of meaningful and effective treatments as well as the prevention of relapse (Marlatt & Friedman, 1981). As such, our assessment of the motivational contexts of prescription drug misuse among young adults provides evidence useful for prevention, intervention, and treatment efforts.

Foremost, our findings suggest that the motivation to use substances as a result of negative situations is a significant driver of prescription drug misuse among young adults active in

nightlife scenes. This motivational context was associated with increases in the frequency of misuse of all three types of prescription drugs. As such, prevention and intervention experts may consider focusing on these types of motivations (e.g. using drugs to deal with conflict with others or to suppress negative emotions) in order to reduce the misuse of all types prescription drugs among young adults. Harm reduction experts may also consider this motivational context in the promotion of techniques to minimize the risks associated with prescription drug misuse. Young adults express a proven willingness to take up harm reduction (Kelly, 2007; Rosenberg et al., 2011). Negative motivations also led to substance use problems both directly and indirectly through increases in the use of prescription pain killers. As such, negative motivations are a focal point for clinicians in substance abuse treatment programs and may be used to inform the content of interventions for young adults with opioid misuse problems.

Positive situations were associated with increases in the frequency of prescription pain killer and stimulant misuse, not sedatives. However, this motivational context was not directly or indirectly associated with drug problems or symptoms of dependence. While previous studies have found an association between the use of other drugs, such as cocaine and ecstasy, under such circumstances and increased frequency of use (Palamar et al., 2008; Starks et al., 2011), our findings do not support that problems are occurring as a result of this. In this respect, it is noteworthy that we do not find positive motivational contexts to influence prescription drug problems or symptoms of dependence. While the circumstances influencing the misuse of prescription drugs in this motivational context can positively reinforce drug use, these motivations are not associated with clinically significant outcomes. A key aspect of these positive motivations may be related to social embeddedness. Scholars have shown drug use to be a tool for cultivating social embeddedness and solidarity among young adults (Kavanaugh & Anderson, 2008). As such, harm reduction efforts may be particularly germane to these youth with these motivations. Although these positive social contexts may make youth reluctant to eliminate prescription drug misuse out of concern for losing meaningful social bonding activities, they may be especially amenable to integrating harm reduction techniques into their routines. By working within the social contexts of these groups, public health professionals may be able to promote 'intraventions' aimed at reducing the harms associated with prescription drug misuse on the terms of members of these social scenes (Friedman et al. 2004).

Lastly, it is noteworthy that tempting situations had no influence on the frequency of misuse of any prescription drug type. They also had no influence on drug problems or symptoms of dependence. Other studies have previously indicated that temptations influence drug use (Klein et al., 2003). The role of temptation may be diminished to some degree for prescription drugs given that they have a legitimate purpose and may not elicit the same attraction to the forbidden as illicit substances among some youth.

4.1 Limitations

Though the results provide much needed insight into the motivational contexts of prescription drug misuse and its links to substance abuse problems among young adults, some limitations should be considered. First, this project was designed to study young adults

involved in nightlife scenes. This population is an important one to study due to the salient role that substances often play in nightlife venues, yet these findings may not generalize to the entire young adult population. The methods here, however, allow for us to identify problems within an at-risk population, whereas surveys of the general youth population have lower levels of misuse, which makes the study of such influences more challenging. Second, as we sampled from nightlife venues with a time-space sampling method, we may have oversampled people who are more frequent nightlife participants. Additionally, our definition of “misuse” – derived from Compton & Volkow (2006) – does not account for distinctions between medical misuse and non-medical use that have been identified as important by others (e.g. McCabe et al., 2009). Finally, as subjects were asked to self-report behaviors, there may be a social desirability bias or recall bias in the reporting of drug use behaviors, as is common in such studies. However, studies have shown that computer-assisted surveys improve self-report measures of sensitive topics (Gribble et al, 2000; Williams et al., 2000).

4.2 Conclusions

Overall, our findings indicate that being motivated to misuse prescription drugs due to negative situations is a key driver of drug problems and symptoms of dependence among young adults. Prescription pain killer misuse is an important pathway to these problems. Addressing the experience of negative situations as a motivator for prescription drug misuse may provide a primary means to reduce substance abuse problems among young adults who misuse prescription drugs. Additionally, clinicians might consider this a key point of intervention for young people at risk of relapse to prescription drug misuse. A focus on both positive and negative motivations to use drugs may also be a means to promote the uptake of harm reduction strategies among these youth.

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Highlights

- Negative motivations are associated with increases in prescription drug misuse frequency.
- Positive motivations are associated with increases in prescription drug misuse frequency.
- Negative motivations are directly and indirectly associated with prescription drug problems.
- Tempting motivations are not associated with any prescription drug outcomes.

Figure 1.

Relationship of motivational factors to prescription drug problems. Unstandardized results of the hypothesized model (non-significant paths displayed as dotted lines).

Note: Model controls for demographic factors, though not depicted for model clarity. P-values indicated via asterisks: †p = 0.06; *p < .05; **p < .01; ***p < .001

Figure 2.

Final path model of the influence of motivational factors on prescription drug problems. Direct effects from the Negative Situations subscale to CIDI and SIP-AD scores are freely estimated (non-significant but freely estimated paths are displayed as dotted lines and path coefficients are omitted).

Note: Model controls for demographic factors, though not depicted for model clarity. †p 0.06; *p 0.05; **p 0.01; ***p 0.001.

Table 1

Demographic characteristics of the Sample and Demographic Differences in IDTS Subscales.

Demographic Characteristics	N = 400		Negative Situations		Positive Situations		Tempting Situations	
	n	%	M	SD	M	SD	M	SD
Race/Ethnicity			$F(3, 396)=1.82$		$F(3, 396)=4.15^{**}$		$F(3, 396)=4.62^{**}$	
White	269	67.3	1.88	0.76	2.41 ^a	0.84	1.67 ^a	0.59
Latino	32	8.0	2.18	0.96	2.90 ^b	1.03	1.98 ^b	0.71
Black	20	5.0	2.10	0.75	2.68 ^{ab}	0.88	2.07 ^b	0.84
Other	79	19.8	1.87	0.81	2.31 ^a	0.94	1.67 ^a	0.68
Gender/Sexual Orientation			$F(3, 396)=2.19$		$F(3, 396)=6.24^{***}$		$F(3, 396)=5.94^{**}$	
LGBQ Male	110	27.5	1.85	0.79	2.34 ^{ab}	0.90	1.64 ^{ab}	0.60
Straight Male	107	26.8	1.89	0.84	2.71 ^c	0.90	1.90 ^c	0.72
LGBQ Female	82	20.5	2.11	0.82	2.49 ^{ac}	0.88	1.76 ^{ac}	0.67
Straight Female	101	25.3	1.86	0.67	2.22 ^b	0.79	1.55 ^b	0.53
Relationship Status			$F(1, 398)=1.08$		$F(1, 398)=0.77$		$F(1, 398)=0.30$	
Single	222	55.5	1.95	0.78	2.41	0.88	1.73	0.64
Partnered	178	44.5	1.87	0.79	2.49	0.90	1.69	0.64
Education			$F(3, 396)=4.27^{**}$		$F(3, 396)=1.32$		$F(3, 396)=4.55^{**}$	
High school diploma/GED or less	26	6.5	2.08 ^{ab}	0.89	2.69	1.05	1.97 ^a	0.74
Some college or Associate's	64	16.0	2.18 ^a	0.98	2.52	0.95	1.84 ^a	0.69
Currently enrolled in college	83	20.8	1.94 ^{ab}	0.83	2.49	0.98	1.80 ^a	0.73
4-year degree or higher	227	56.8	1.81 ^b	0.68	2.38	0.81	1.62 ^b	0.57
Parental Socioeconomic Status			$F(2, 394)=0.26$		$F(2, 394)=0.18$		$F(2, 394)=2.53$	
Poor or working class	92	23.0	1.96	0.76	2.47	0.90	1.84	0.76
Middle class	154	38.5	1.92	0.78	2.46	0.90	1.71	0.61
Upper middle class or rich	151	37.8	1.89	0.82	2.41	0.87	1.65	0.59
Not reported	3	0.8	--	--	--	--	--	--

Note: Means with differing superscripts within columns differed significantly ($p < 0.05$) in LSD-adjusted post hoc analyses (those with the same superscript do not differ at $p < .05$).

Table 2

Demographic Differences in Substance Use Outcomes.

	Pain Killer Freq			Sedative Freq			Stimulant Freq.			SIP-AD			CIDI		
	Median	IQR		Median	IQR		Median	IQR		M	SD		M	SD	
Total Sample (n=400)	3.0	0, 10		4.0	0, 12		3.0	0, 15		5.03	6.65		2.25	2.24	
Race/Ethnicity	$H(3)=15.01^{**}$			$H(3)=3.83$			$H(3)=1.26$			$F(3, 396)=1.87$			$F(3, 396)=1.84$		
White	3.0 ^a	0, 9		4.0	1, 10		3.0	0, 15		4.71	6.47		2.24	2.25	
Latino	10.0 ^b	4, 29		3.0	0, 23		2.5	0, 9		7.41	8.67		2.94	2.14	
Black	5.5 ^{ab}	2, 14		6.0	3, 24		6.0	0, 23		6.35	6.21		2.60	2.23	
Other	2.0 ^a	0, 10		3.0	0, 10		5.0	0, 20		4.78	6.34		1.90	2.18	
Gender/Sexual Orientation	$H(3)=6.59$			$H(3)=6.96$			$H(3)=3.05$			$F(3, 396)=1.15$			$F(3, 396)=0.55$		
LGBQ Male	3.0	0, 10		4.0	1, 11		3.0	0, 12		5.35	7.19		2.25	2.42	
Straight Male	3.0	0, 15		2.0	0, 20		4.0	0, 20		5.53	6.60		2.46	2.21	
LGBQ Female	4.0	1, 10		5.0	2, 16		3.0	0, 11		5.21	7.44		2.18	2.19	
Straight Female	2.0	0, 6		3.0	0, 10		5.0	0, 20		3.98	5.26		2.07	2.09	
Relationship Status	$U(398)=19,997.5$			$U(398)=21,199.5$			$U(398)=20,337.0$			$F(1, 398)=0.09$			$F(1, 398)=0.14$		
Single	3.0	0, 10		3.0	0, 10		3.0	0, 15		5.11	6.63		2.29	2.18	
Partnered	3.0	0, 10		4.0	1, 20		5.0	0, 20		4.92	6.70		2.21	2.31	
Education	$H(3)=22.78^{***}$			$H(3)=8.71^{*}$			$H(3)=3.80$			$F(3, 396)=7.01^{***}$			$F(3, 396)=6.23^{***}$		
High school diploma/GED or less	15.0 ^a	3, 53		15.0 ^a	1, 22		1.0	0, 18		8.50 ^a	9.88		2.81 ^a	2.25	
Some college or Associate's	5.0 ^{a,b}	2, 15		5.0 ^a	2, 20		5.0	0, 15		7.19 ^a	7.77		3.08 ^a	2.55	
Currently enrolled in college	3.0 ^{b,c}	0, 10		2.0 ^a	0, 6		5.0	0, 15		5.26 ^b	6.76		2.47 ^a	2.32	
4-year degree or higher	2.0 ^c	0, 7		4.0 ^a	0, 10		3.0	0, 15		3.93 ^b	5.48		1.86 ^b	2.03	
Parental Socioeconomic Status	$H(2)=1.80$			$H(2)=0.96$			$H(2)=0.85$			$F(2, 394)=0.29$			$F(2, 394)=0.46$		
Poor or working class	3.0	0, 10		4.0	1, 15		3.0	0, 15		5.51	6.10		2.42	2.36	
Middle class	2.0	0, 9		4.0	0, 10		3.0	0, 15		4.88	6.58		2.14	2.19	
Upper middle class or rich	4.0	0, 10		3.0	0, 15		4.0	0, 15		4.94	7.11		2.28	2.22	

Note: Means and medians with differing superscripts within columns differed significantly ($p < 0.05$) in LSD-adjusted (ANOVA) or Bonferroni-adjusted (Kruskal-Wallis) post hoc analyses (those with the same superscript do not differ at $p < 0.05$). Interquartile ranges were rounded to the nearest whole number in cases with decimal points.