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Depressive symptoms, negative urgency and substance use initiation in adolescents

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ABSTRACT

Background: Studies show depressive symptoms are associated with substance use in adolescents, but the mechanism underlying this association is still unclear. This study investigated negative urgency – the disposition to rash action during emotional states – as a factor explaining relations between depressive symptoms and use of several substances.
Methods: In this cross-sectional study, 476 adolescents (mean age 14.5 years) completed self-report surveys. Regression models and products of coefficient analyses examined the overall relation of depressive symptoms to substance use and negative urgency as a statistical mediator of this association.
Results: Depression levels associated with increased likelihood of lifetime use of cigarettes, other forms of tobacco, marijuana, alcohol, inhalants, prescription painkillers, and any substance. Relations between depression levels and lifetime use of alcohol, inhalants, and any substance were accounted for (i.e., statistically mediated) by negative urgency. In adolescents endorsing lifetime use, depression levels associated with younger age of first use of other forms of tobacco and alcohol as well as use frequency of cigarette, alcohol, and composite frequency. Negative urgency accounted for the covariance between depression level and age of first use of alcohol, but did not for other forms of tobacco or frequency of use of any substances.
Conclusions: Depression levels are associated with lifetime use of a variety of substances in early adolescence and targeting this risk factor with preventive efforts may be useful in reducing risk. Negative urgency may be an important target for interventions aimed at alcohol and inhalant use.

1. Introduction

Adolescent substance use remains remarkably prevalent in the general population (Substance Abuse and Mental Health Services Administration and Quality, 2013). Alcohol and drug use in adolescence greatly increases risk of substance use disorders in adulthood (Englund et al., 2008; Grant and Dawson, 1997; Lynskey et al., 2003) as well as poorer educational outcomes, lower income, greater welfare dependence and unemployment and lower relationship and life satisfaction (Fergusson and Boden, 2008). Thus, efforts toward understanding of processes associated with initiation of adolescent substance use may help inform substance use prevention efforts and ultimately reduce the public health burden of substance use disorders.

In adolescent samples there is evidence that higher level of depressive symptoms associate with an increase in smoking uptake and progression (Audrain-McGovern et al., 2011, 2012) and increased risk for early life initiation of alcohol or illicit drug use (Tang and Orwin, 2009). However, the mechanisms that account for the covariation between depressive symptoms and substance use initiation are unclear. Identifying whether depressive symptoms associate with initiation of use of specific substances and elucidating factors that link depressive symptoms and teen substance use initiation could shed light on the development of prevention interventions that target these mediational processes and ultimately perhaps buffer substance use risk channeled by depressive symptoms.

Dispositions towards mood-based rash action (i.e., trait urgency) may be an underlying mechanism linking depressive symptoms and substance use initiation. Urgency is a personality construct that reflects the tendency to act rashly without considering consequences specifically during emotional states and can be

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separated into rash actions during extreme positive states (i.e., positive urgency) and rash actions during periods of extreme negative emotion (i.e., negative urgency; Cyders and Smith, 2008). Empirical evidence shows that urgency is psychometrically and conceptually distinct from other impulsive traits such as the tendency to seek out novel and thrilling experiences (i.e., sensation seeking) and the tendency to act without thinking and inability to remain focused on a task (i.e., deficits in conscientiousness; Cyders and Smith, 2008; Smith et al., 2007).

In considering mechanisms accounting for depression-substance use relations, negative urgency may be particularly relevant trait within the overarching cluster of impulsivity-relevant constructs because of its link to both affect and rash actions. We purport that depressive symptoms may generate an accumulation of affective disturbance that may ultimately cloud one's judgment and engender greater opportunities for rash actions in negative affect states (i.e., negative urgency). Specifically, depressive symptoms such as agitation/restlessness, crying, and other negative states as well as difficulty concentrating may interfere with one's ability to inhibit methodical decision-making. One such expression of rash action may be the decision to overlook the long-term negative consequences of substance use and experiment with substances. Indeed, negative urgency has been shown to associate with amount of use of alcohol, cigarettes, and illicit drugs (i.e., marijuana, cocaine, LSD, heroin, ecstasy, other illegal drugs, and misuse of prescription drugs; Kaiser et al., 2012; Settles et al., 2012). Furthermore, negative urgency associates with depression in adolescence and children (d'Acremont and Van der Linden, 2007; Marmorstein, 2013) and one study showed negative urgency partially mediated relations between depression and problematic drinking in college students (Gonzalez et al., 2011). Yet, a sizable proportion of substance users initiate in adolescence prior to entering young adulthood (Substance Abuse and Mental Health Services Administration and Quality, 2013). Furthermore, age of initiation may also be an important factor with studies suggesting that earlier onset of use of a substance results in poorer alcohol (Hingson and Zha, 2009; Kang et al., 2014) and marijuana (Ellickson et al., 2004) related outcomes. Thus, understanding processes surrounding initiation is important and current research on risk factors related to substance use in young adulthood may inadequately capture these processes.

This cross-sectional study is the first to our knowledge that investigates negative urgency as a mediator of associations between depressive symptoms and onset of use of various substances in early adolescence (mean age 14.5). We hypothesized that depressive symptoms would be associated with increased likelihood of substance initiation, and that this relation would be accounted for (i.e., statistically mediated by) negative urgency. As secondary outcomes we examined, among the subsample of substance initiators, retrospective reports of age of use onset as well as use frequency within past 30 days. Here, we hypothesized that higher depressive symptoms, higher negative urgency, and their mediational relations would associate with earlier age of onset and greater use frequency. Given the prior scant literature on this topic, we did not propose hypotheses regarding which particular substances might be associated by the aforementioned mediational relationships. Nonetheless, assessment of a variety of different substances, which often has not been addressed in prior work in this area, allows us to make wider spanning generalizations to drug use etiology and prevention programs targeting multiple substances.

2. Methods

2.1. Participants

The current report is a secondary analysis of 9th grade participants enrolled in one of two public high schools in the Los Angeles metropolitan area participating in a study on the relation between personality, psychopathology, health behavior, and substance use. All students were eligible to participate with the exception of those in either special education or English as a second language programs. A total of 807 students were eligible. Of the 689 (85%) who provided assent, 585 (82%) provided parental consent, enrolled in the study, and were administered the study survey. The IRB at the University of Southern California approved all procedures used in this study.

2.2. Procedure

Students completed paper-and-pencil surveys assessing urgency, substance use, depression, and other constructs within the domain of emotion and health behavior administered on-site at schools across two mandatory 40-min class periods in May, 2013. Data collectors clearly explained that responses would be confidential and not shared with teachers, parents, or school staff, per a certificate of confidentiality from federal government and the institutional review board.

2.3. Measures

2.3.1. Substance use questionnaire. Substance use measures from the Youth Behavior Risk Surveillance Survey (YBRS) and the Monitoring the Future Questionnaire (MTF), which have been extensively validated in adolescents (Eaton et al., 2010; Johnston et al., 2010), were used to assess lifetime and past 30 days use frequency for a variety of illicit and licit prescription substances. These questionnaires instruct respondents that use refers to use "without a doctor's notice/order" for substances that can be prescribed. Small sips of alcohol for religious purposes were explained to not count towards alcohol use.

2.3.1.1. Lifetime use and age of onset. Initiation (yes/no; any lifetime use) and age of first use (≤8, 9–10, 11–12, 13–14, 15–16, or ≥17 years old) were collected for the following 20 drug classes: A whole cigarette; other forms of tobacco (e.g., cigars, cigarillos, e-cigarettes, flavored tobacco); smokeless tobacco; one full drink of alcohol; marijuana; inhalants; cocaine; methamphetamine; psychedelics (e.g., LSD, mushrooms, or other psychedelics); ecstasy; heroin; salvia; prescription painkillers to get "high"; barbiturates, tranquilizers or sedatives; cold/cough medicine to get "high"; diet pills; prescription stimulants to get "high"; antihistamines to get "high"; and any other pill or illegal drug to get "high". An "any lifetime substance use" composite variable (yes/no) was coded which denoted students who endorsed use of any of the 20 substances assessed in the study. A similar variable denoting "age of onset of any substance" was coded which noted the earliest age of use of any of the 20 substances.

2.3.1.2. Past 30 day use. Frequency of use in the past 30 days (0 = no days, 1 = 1–2 days, 2 = 3–5 days, 3 = 6–9 days, 4 = 10–14 days, and 5 = 15–30 days) was assessed for six substances: alcohol, tobacco, marijuana, illicit stimulants (e.g., methamphetamine, cocaine), prescription stimulants (e.g., Adderall, Ritalin), and prescription painkillers (e.g., Oxycontin, Vicodin). Choice of the six substances to include when asking about frequency of past 30 day use was based off of prior literature of indicating higher lifetime use prevalence rates in national samples (Johnston et al., 2014) and in prior studies in the target location (Unger, 2014) relative to the other substances, as well as conceptual interests that these substances may be particularly related to emotion disturbance. Given the low variance in individual use for illicit substances, a composite frequency of use variable was created by summing the frequencies reported across all six substances.

2.3.2. UPPS impulsive behavior scale (UPPS-P) negative urgency subscale. The UPPS-P impulsive behavior scale (Whiteside and Lynam, 2001), which has been used in adolescent samples (Robinson et al., 2014), has a subscale tapping negative urgency (12 items; e.g., "When I feel bad I will often do things I regret later to make myself feel better now" and "When I'm upset I often act without thinking"). Participants rate statements on a 4-point Likert scale from "disagree strongly" (1 point) to "agree strongly" (4 points) with higher scores indicating higher levels of urgency. An average score per item was computed for the negative urgency subscale. Negative urgency has been linked to addictive behaviors (Coskunpinar and Cyders, 2012; Dir et al., 2013; Settles et al., 2012; Spillane et al., 2012) and has been shown to have good discriminant validity from other impulsivity constructs (Smith et al., 2007).

2.3.3. Center for epidemiologic studies depression scale (CESD). The CESD is a 20-item measure of how often over the past week feeling and behaviors associated with depression (e.g., "I felt sad" and "I felt that everything I did was an effort") were experienced. Participants rate statements on a 4-point likert scale from "rarely or none of the time" (0 points) to "most or all of the time" (3 points) with higher scores indicating higher levels of depressive symptoms. An average score for all questions was computed to give a total mean score. The CESD has shown good reliability (Chabrol et al., 2002) and validity in adolescent samples (Garrison et al., 1991; Radloff, 1991).