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Emotional self-control and dysregulation: A dual-process analysis of pathways to externalizing/internalizing symptomatology and positive well-being in younger adolescents



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ABSTRACT

Objectives: There is little knowledge about how emotional regulation contributes to vulnerability versus resilience to substance use disorder. With younger adolescents, we studied the pathways through which emotion regulation attributes are related to predisposing factors for disorder.

Methods: A sample of 3561 adolescents (M age 12.5 years) was surveyed. Measures for emotional self-control (regulation of sadness and anger), emotional dysregulation (angerability, affective lability, and rumination about sadness or anger), and behavioral self-control (planfulness and problem solving) were obtained. A structural model was analyzed with regulation attributes related to six intermediate variables that are established risk or protective factors for adolescent substance use (e.g., academic involvement, stressful life events). Criterion variables were externalizing and internalizing symptomatology and positive well-being.

Results: Indirect pathways were found from emotional regulation to symptomatology through academic competence, stressful events, and deviance-prone attitudes and cognitions. Direct effects were also found: from emotional dysregulation to externalizing and internalizing symptomatology; emotional self-control to well-being; and behavioral self-control (inverse) to externalizing symptomatology. Emotional self-control and emotional dysregulation had independent effects and different types of pathways.

Conclusions: Adolescents scoring high on emotional dysregulation are at risk for substance dependence because of more externalizing and internalizing symptomatology. Independently, youth with better behavioral and emotional self-control are at lower risk. This occurs partly through relations of regulation constructs to environmental variables that affect levels of symptomatology (e.g., stressful events, poor academic performance). Effects of emotion regulation were found at an early age, before the typical onset of substance disorder.

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1. Introduction

Self-regulation has been an increasingly prominent theme in research on substance use and abuse (Wills et al., 2015b). Self-regulation measures have been linked to early-onset substance use and to substance use problems in late adolescence and early adulthood (Patock-Peckham et al., 2001; Simons et al., 2009, 2010; Tarter

et al., 2003; Wills et al., 2011). Furthermore, life-span studies have shown that early observations of self-regulation predict mental and physical health outcomes over considerable time periods (Martin et al., 2007; Moffitt et al., 2011). Recent neuroimaging studies are showing structural and functional brain anomalies suggestive of emotion-regulation deficits among individuals with drug use disorders (Ersche et al., 2013; Kober, 2014). However, reviewers point out that it is not known whether emotion-regulation differences predate the onset of the disorder (Cheetham et al., 2010; Goldstein and Volkow, 2011). In this paper, we discuss evidence on behavioral and emotional regulation and report data on how emotion regulation is related to established risk and protective factors for substance use disorders. The data were obtained in early adoles-

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cence (11–14 years of age), before the typical age of emergence for substance disorder.

1.1. Behavioral regulation and substance use

A considerable body of evidence has accumulated on behavioral self-control and dysregulation. Behavioral self-control (also termed planfulness or reflectiveness) is typically indexed by measures such as planning, persistence, and problem solving (Wills and Dishion, 2004), linking behaviors and consequences over time (Zimbardo and Boyd, 1999), and monitoring progress toward goals (Hoffman et al., 2009). Behavioral self-control has consistently shown inverse relations to substance use (e.g., Audrain-McGovern et al., 2006; Brody and Ge, 2001; Wills et al., 2000, 2001a,b, 2004a, 2007a,b; Wills and Stoolmiller, 2002; Zimbardo and Boyd, 1999) and some moderation effects have been demonstrated (e.g., Wills et al., 2002a, 2008). Behavioral dysregulation, indexed by measures tapping the tendency to act without thinking, be unable to inhibit prepotent responses, or have a tendency to rapidly discount the value of future rewards compared with present rewards, is positively related to likelihood/intensity of substance use (for reviews see Dawe and Loxton, 2004; Lejuez et al., 2010; Madden and Bickel, 2010; Perry and Carroll, 2008). In general, this research has studied self-regulation without reference to current or dispositional emotion. While the participants in these studies may have experienced positive or negative emotions at some time, studies relating behavioral self-control or impulsiveness to substance use have generally been conducted without reference to emotional states, though it has been recognized that decision making may be influenced by emotion (Cyders et al., 2007; Lieberman, 2007a; Metcalfe and Mischel, 1999; Steinberg, 2007).

The present research was based on a *dual-process model* of regulation. The dual-process approach posits that two distinct systems are involved in responding to environmental cues and regulating behavior. The two systems are alternatively termed automatic vs. controlled (Lieberman, 2007b; Wiers et al., 2007), reflective vs. impulsive (Hoffman et al., 2009), reasoned vs. reactive (Gerrard et al., 2008), or self-control and dysregulation (Wills et al., 2015b). The basic findings supporting the dual-process approach are (a) confirmatory studies of regulation measures show that a two-factor solution fits better than a one-factor solution, (b) measures of self-control and dysregulation show independent contributions (in opposite directions) to prediction of substance use, and (c) the two systems have different types of pathways to substance abuse (Wills and Ainette, 2010; Wills et al., 2011, 2013). This approach has heuristic value for clarifying SUD etiology because greater predictive power is obtained when considering both systems rather than only one (Gibbons et al., 2009; Hoffman et al., 2009) and the dual-process model helps to delineate multiple pathways to substance use problems (Simons et al., 2009; Wills et al., 2011). Previous studies with dual-process models have focused on behavioral regulation; in the present research we extend this approach to the study of emotional regulation.

1.2. Emotional regulation and substance use

Theory on emotion regulation has been available (e.g., Calkins, 1994; Eisenberg and Fabes, 1992; Southam-Gerow and Kendall, 2002), but generally has not been a prominent theme in substance abuse research. The exception is the self-medication model of Khantzian (1990), which proposes that poor regulation of negative emotional states (particularly anger) is an underlying factor in vulnerability to substance use disorder. This theory has influenced research on stress and coping motives for substance use (Audrain-McGovern et al., 2009; Cheetham et al., 2010; Sinha, 2008; Weinstein and Mermelstein, 2013a; Wills et al., 1999a,

2001c, 2002b, 2004b) and diagnostic studies have consistently shown that affective disorders (anxiety disorder and depressive disorder) tend to co-occur with substance use disorders (Kober, 2014). However, the temporal ordering of affective and substance use disorders remains unclear (Cheetham et al., 2010); the fact that negative mood is elevated among substance abusers does not necessarily show how they are causally linked (Kassel and Veilleux, 2010); and experience sampling studies have not consistently found a real-time relation between negative affect and drinking (see Mohr et al., 2010). Thus support for the self-medication model remains in flux. New studies have suggested alternate conceptions of affectivity and drug use, including reduced sensitivity to natural rewards (Audrain-McGovern et al., 2011, 2012); mood variability (Simons and Carey, 2002; Simons et al., 2009; Weinstein and Mermelstein, 2013b); and distinguishing situational and dispositional aspects for positive and negative affect (Colder et al., 2010; Simons et al., 2014).

Studies relating measures of emotional regulation to psychiatric or substance use disorders have mainly been conducted with adult substance abusers and focused on emotional dysregulation (e.g., Berking et al., 2011; Berking and Wupperman, 2012; Bonn-Miller et al., 2011; Fox et al., 2008; Fucito et al., 2010; Volkow et al., 2010). However, in our view the major issue is that most studies have not determined how emotion regulation is related to substance abuse. We think it is essential to determine the processes through which emotion regulation is linked to outcomes. Though regulation processes may be directly related to outcomes, some research with adolescents has shown that the linkage of behavioral self-regulation to substance use/abuse occurs through relations to intermediate variables (Wills and Ainette, 2010). Here, we adopt this approach for emotion regulation, assessing likely social/environmental and cognitive/attitudinal mediators and using structural equation modeling to determine how emotion regulation is related to substance-relevant outcomes.

Previous studies with adolescents have demonstrated a consistent measurement structure for behavioral and emotional regulation (Wills et al., 2006) and have related behavioral and emotional regulation to substance use problems (Wills et al., 2011). However these studies have assessed a limited range of mediators and have not determined the relation of emotional-regulation measures to externalizing or internalizing symptomatology, which are among the most-studied predictors of substance use disorder (Wills et al., 2005). Longitudinal studies have shown externalizing symptomatology in early adolescence (conduct-disorder related) to be a robust predictor of substance use disorder in late adolescence and early adulthood (e.g., Brook et al., 1995; Chassin et al., 1999; Englund et al., 2008; Fergusson et al., 2007; Guo et al., 2001; Pulkkinen and Pitkanen, 1994; White et al., 2001; Windle, 1990). Findings on internalizing symptomatology (depressive or anxiety-disorder related) are less consistent (for reviews see Cheetham et al., 2010; Colder et al., 2010). Though some studies have shown positive relations of internalizing symptomatology to substance use, results may vary by substance (King et al., 2004; Maskowsky et al., 2014; Tarter et al., 2007) and extent of comorbidity (Colder et al., 2013; Goodman, 2010; King and Chassin, 2008; Pardini et al., 2007; Roberts et al., 2007; Scalco et al., 2014; Schuckit and Smith, 2006; Wittchen et al., 2007).

1.3. Rationale for present research

To gain more understanding of how emotional regulation contributes to risk for substance use disorder, we conducted a study in early adolescence, a time when few if any persons have developed a disorder. We used a dual-process approach, positing that emotional self-control and dysregulation are distinct constructs that make independent contributions to outcomes. We assessed

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