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Explicating the role of emotion dysregulation in risky behaviors: A review and synthesis of the literature with directions for future research and clinical practice

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Abstract

Extant literature provides support for emotion dysregulation as a transdiagnostic construct with relevance to the pathogenesis and treatment of numerous psychiatric difficulties and maladaptive behaviors, including risky, self-destructive, and health-compromising behaviors (e.g., substance use, risky sexual behavior). The aim of the present review is to synthesize theory and empirical research on the relationship between emotion dysregulation and risky behaviors. In addition, we highlight cutting-edge approaches for investigating the emotion dysregulation-risky behavior, including examination of the role of positive emotional experiences and inclusion of context-dependent and physiological assessments. Finally, we note the relevance of the emotion dysregulation-risky behavior relation to intervention efforts aimed at reducing risky behaviors.

Keywords

emotion dysregulation; risky behaviors; difficulties regulating positive emotions; context-dependent assessment; physiological assessment

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Introduction

Over the past decade, researchers have become increasingly interested in identifying factors that underlie or maintain risky behaviors (i.e., any behavior that puts one at risk for a negative outcome, be it physical, emotional, social, or financial), with a particular focus on such behaviors that heighten risk for negative health or safety outcomes, such as substance use, risky sexual behavior, deliberate self-harm, aggressive behavior, and disordered eating. These risky, self-destructive, and health-compromising behaviors have been linked to a wide range of deleterious societal costs, including disease, injury, and healthcare usage; crime and criminal justice system costs; educational attainment; and worker productivity [1,2].

A growing body of research suggests that risky behaviors may be driven by deficits in emotion regulation. Emotion regulation is a foundational skill considered to be integral to normative development and adaptive functioning across multiple domains [3,4]. Developmental researchers have defined emotion regulation as the intrinsic and extrinsic processes involved in monitoring, evaluating, and modulating emotional reactions to accomplish one's goals [5]. Drawing upon this definition, KL Gratz and L Roemer [6] proposed an integrative conceptualization of emotion regulation in adulthood as a multidimensional construct involving the awareness, understanding, and acceptance of emotions; ability to control impulsive behaviors and engage in goal-directed behaviors when experiencing negative emotions; and flexible use of situationally-appropriate strategies to modulate the intensity and duration of emotional responses, rather than to eliminate emotions entirely. Conversely, deficits in any of these areas are considered indicative of emotion *dys*regulation. A substantial body of research provides support for the role of emotion dysregulation in various forms of psychopathology and maladaptive behaviors [7], including behaviors that were traditionally thought to be driven primarily by impulsivity, disinhibition, or risk-taking propensity, such as risky sexual behavior [8,9].

The aim of the present review is to synthesize research on the relationship between emotion dysregulation and risky behaviors to inform future research and clinical practice in this area. First, we provide a theoretical account relating emotion dysregulation to risky behaviors. We then describe empirical support for the role of emotion dysregulation in risky behaviors, with an emphasis on novel approaches to the study of the emotion dysregulation-risky behavior relation. Finally, we discuss the relevance of these findings to intervention efforts aimed at reducing risky behaviors.

Theory Linking Emotion Dysregulation and Risky Behaviors

Extant research suggests that risky behaviors are most likely to occur in the context of intense emotion states [10,11], suggesting that engagement in risky behaviors is context-dependent. A growing body of literature indicates that heightened emotion dysregulation may increase the likelihood of engaging in risky behaviors in the presence of intense emotions. For example, it has been theorized that individuals who exhibit greater emotion dysregulation may be more likely to engage in risky behaviors in an attempt to alleviate or distract themselves from emotional states perceived as aversive [12]. Alternatively, the short-term pleasure that may be associated with certain risky behaviors may function to counter or distract from unpleasant emotional states that an individual is unwilling to

approach, tolerate, or accept. Notably, however, although risky behaviors may result in an immediate (short-term) reduction in emotional distress and/or an increase in pleasurable emotion states, they are likely to have paradoxical consequences in the long-term. For example, studies show that engagement in emotionally-avoidant regulation strategies can result in the exacerbation of distress [13]. Moreover, the negative consequences associated with risky behaviors may contribute to the experience of more negative emotions (e.g., guilt, shame) that further drive emotionally-avoidant regulation strategies. Further, because risky behaviors provide immediate reinforcement, individuals may be more likely to use these behaviors to escape emotional distress in the future, reducing experiences in which adaptive modulation of emotions is reinforced [14].

It is also possible that heightened levels of emotion dysregulation may reduce one's capacity to control risky behaviors in the context of urges or cues (e.g., drugs, food) for such behaviors. For example, according to the ego-depletion model [15], the capacity for self-regulation is a limited resource. Thus, situations that require self-regulation will deplete this resource, temporarily limiting one's capacity in this regard [15,16]. Low emotional clarity or the nonacceptance of emotions (i.e., secondary emotional responding) may increase emotional intensity and/or reactivity, depleting self-regulation resources. These forms of emotion dysregulation may also increase the likelihood that an individual attempts to avoid their emotions, an emotion regulation strategy that requires effort and may further deplete self-regulation resources [16]. As a result, an individual may have fewer self-regulation resources available to adequately control impulses to engage in rash or risky behaviors when faced with cues for these behaviors.

Empirical Investigations of Emotion Dysregulation and Risky Behaviors

A burgeoning body of empirical research highlights the role of emotion dysregulation in risky behaviors. Emotion dysregulation has been found to be positively associated with overall risky behaviors [17], as well as specific risky behaviors, including substance use [18,19], risky sexual behavior [8,9], deliberate self-harm [20,21], aggressive behavior [22,23], and disordered eating [24,25]. Importantly, many of these aforementioned studies highlight the unique role of emotion dysregulation in risky behaviors above and beyond other risk factors for these behaviors [9,21,25]. For example, in one study of substance dependent inpatients, emotion dysregulation significantly predicted risky sexual behavior above and beyond demographics, depression, sensation seeking, traumatic exposure, and substance use severity [9]. While much of the extant research in this area is cross-sectional, initial prospective investigations also underscore the role of emotion dysregulation in risky behaviors. For example, NH Weiss, et al. [26**] found that improvements in emotion regulation fully accounted for reductions in risky behaviors one month post-manipulation among African American women with sexual assault-related posttraumatic stress disorder. This preliminary research has provided a foundation for more complex investigations of the emotion dysregulation-risky behavior relation. The following section will highlight cutting-edge approaches for broadening our understanding of the role of emotion dysregulation in risky behaviors. Specifically, we have chosen to focus on (1) positive emotional experiences; (2) context-dependent assessment; and (3) physiological markers.

Difficulties regulating positive emotions and risky behaviors—Research on the regulation of emotions has overwhelmingly focused on negative (versus positive) emotional experiences (with the exception of mania) [27]. Yet, dysregulation can occur across both positive and negative emotional systems. For example, individuals have been found to regulate positive emotional experiences [28], and the use of putatively maladaptive strategies to regulate positive emotions increases sympathetic nervous system activation [29], suggesting that the regulation of positive emotions is cognitively taxing [30]. Further, difficulties in specific domains of positive emotion dysregulation (i.e., nonacceptance and/or avoidance of positive emotional states) have also been observed among individuals with psychiatric disorders, including borderline personality disorder, major depressive disorder, panic disorder, and posttraumatic stress disorder [31-34]. Regarding the role of positive emotions in risky behaviors, positive emotional states in particular have been found to increase distractibility [35] and lead to less discriminative use of information [36], which may result in disadvantageous decision-making focused on immediate (vs. long-term) goals [37]. Indeed, research indicates that positive urgency (i.e., behavioral dyscontrol in the context of positive emotions) is associated with a range of risky behaviors, including substance use, gambling, and risky sexual behavior [10].

Notably, however, a dearth of research has explicated the role of other dimensions of positive emotion dysregulation outside of urgency in risky behaviors. In one such study, KL Dixon-Gordon, et al. [38**] utilized ecological momentary assessment to identify the roles of negative and positive emotion differentiation (i.e., the ability to distinguish between distinct emotions of similar valence) in the relation between borderline personality pathology and urges for risky behaviors. Participants high and low in borderline personality pathology responded to questions regarding emotions and impulses to engage in risky behaviors eight times over one day using handheld computers. The relationship between borderline personality pathology group (high versus low) and urges for risky behaviors was found to increase in magnitude as positive (but not negative) emotion differentiation moved from high to low. These findings suggest that difficulties distinguishing among positive emotions may confer risk for risky behaviors among individuals high in borderline personality pathology.

Although recent advances have further elucidated the role of positive emotion dysregulation in risky behaviors, several important questions remain. Likely contributing to the relative lack of research in this area has been the absence of a comprehensive measure assessing positive emotion dysregulation. To address this limitation, NH Weiss, et al. [39*] recently developed and validated a measure of positive emotion dysregulation (the Difficulties in Emotion Regulation Scale – Positive [DERS-Positive]). Results of this study revealed the presence of three dimensions of positive emotion dysregulation, including (1) nonacceptance of positive emotions, (2) difficulties engaging in goal-directed behavior when experiencing positive emotions, and (3) difficulties controlling behaviors when experiencing positive emotions. Consistent with the multidimensional conceptualization of emotion dysregulation on which this measure is based [6], the DERS-Positive subscales evidenced differential associations with relevant emotional and behavioral constructs. These findings highlight the importance of assessing responses to positive emotions beyond simply the ability to inhibit

risky behaviors in their presence. Given that difficulties regulating positive emotions are often overlooked in clinical settings, it is critical that future research explicate the role of these additional dimensions of positive emotion dysregulation in risky behaviors.

Finally, it warrants mention that research on positive emotion dysregulation has focused almost exclusively on heightened positive emotion states, despite theoretical evidence to suggest that emotion dysregulation may also occur in response to low positive emotion states. Individuals who report low levels of positive affect have been found to exhibit greater difficulties with goal-directed behavior (40). Further, nonacceptance of low levels of positive affect has been found to result in paradoxical effects, such that telling individuals to increase their levels of positive affect results in reductions in positive affect (41,42). Finally, difficulties identifying (43), describing (44), and modulating (45) both low and high positive emotion states have been reported in the literature. Importantly, initial evidence suggests that emotion dysregulation stemming from low levels of positive affect may also contribute to risky behaviors. For example, the four-function model (FFM) of self-harm purports that self-harm may function to generate positive emotion states or stimulation (46). Likewise, positive reinforcement motives for alcohol use have been described by the motivational model of alcohol use (47). Consistent with this theory, research provides support for the positive emotion-regulating function of risky behaviors, such that low levels of positive affect have been cited as an antecedent to risky behaviors (48,49), and engagement in risky behaviors has been found to result in an increase in positive affect (48-50). This aforementioned literature highlights the need for future research on the regulation of both low and high intensity positive affective states. For example, empirical literature has explored positive emotion intensity as an antecedent and consequence of risky behaviors; however, the role of individual's *responses* to diminished positive affective states in risky behaviors is unclear. Further, in a recent review, Bentley, Nock, and Barlow (51) suggested the need for laboratory-based and experience sampling methodologies to determine whether positive and negative reinforcement processes underlying risky behaviors are distinct.

Context-dependent assessment of emotion dysregulation and risk-taking in the lab—The vast majority of research on the emotion dysregulation-risky behavior relation has relied on correlational designs and self-report data, thus assessing dispositional tendencies towards emotion dysregulation (i.e., average or typical experiences) and retrospective reports of risky behaviors. Importantly, however, literature suggests that emotion dysregulation and risky behaviors are context-dependent. Indeed, levels of emotion dysregulation and risky behaviors may vary in response to external [52*,53] and internal [12,54] events. For example, emotion dysregulation and risky behaviors may be related to the presence of specific emotional experiences (e.g., shame) or intensities, or occur only when confronted with specific stressors (e.g., interpersonal).

Although limited, what research has been done supports the context-dependent nature of both emotion dysregulation and risky behaviors. For example, MA Cyders, et al. [55**] explored the role of dispositional tendencies towards positive urgency in both risk-taking propensity (using the Balloon Analog Risk Task [BART]) [56] and alcohol consumption following both neutral and positive mood inductions among college students. They found that positive urgency predicted greater risk-taking propensity following a positive (but not

neutral) mood induction. Similarly, higher positive urgency was associated with greater alcohol consumption only after a positive mood induction. In a second study, JM Lavender, et al. (unpublished) assessed the relation between state levels of emotion dysregulation (assessed using the State – Difficulties in Emotion Regulation Scale) following a laboratory stressor and retrospective reports of alcohol and drug problems in a sample of community women. State emotion dysregulation (overall and many of the specific dimensions) was found to be significantly positively associated with alcohol and drug problems. Finally, empirical evidence suggests that negative affect and trauma cue exposures are associated with an increase in risky behavior-related outcomes in the laboratory (e.g., attentional bias to drug cues and cravings) [57-59]. Taken together, these findings suggest that levels of emotion dysregulation and risky behaviors following emotionally-evocative tasks are important correlates of self-reported risky behaviors and emotion dysregulation, respectively. Notably, however, we are not aware of any investigations that have utilized state-dependent measures of both emotion dysregulation and risky behaviors to assess their relation to one another. Elucidating the specific external and internal states related to risk-taking is a critical step in this body of research, as such findings might highlight the utility of targeted interventions focused on teaching strategies for reducing risky behaviors in particular contexts.

Physiological markers of emotion dysregulation and risky behaviors in the lab

—In addition to focusing primarily on the regulation of negative affective states and dispositional tendencies towards emotion dysregulation, extant research is also limited through its reliance on subjective assessments of *in vivo* emotional experiences. Notably, however, a growing body of literature highlights physiological processes underlying the ability to regulate emotions. For example, reduced autonomic nervous system flexibility, and heart rate variability (HRV) in particular, is considered a central physiological index of emotion regulation capacity [60]. HRV provides an index of cardiac vagal tone, or parasympathetic nervous system influences on the heart, such that higher HRV is related to flexible and adaptive responding to environmental demands [60,61], whereas lower HRV is a marker of worse emotion regulation ability [60,62]. Additionally, pre-ejection period (PEP), an index of central sympathetic nervous system activation, has been linked to reward sensitivity [63]. Specifically, shortened PEP has been associated with greater sympathetic nervous system activation, and this attenuated sympathetic nervous system activation has been linked to reward insensitivity [63]. Other research highlights the hypothalamic-pituitary-adrenal (HPA) axis as an important index of emotion dysregulation [5,64,65]. Specifically, use of putatively maladaptive strategies following exposure to stress-inducing stimuli has been found to be associated with increases in cortisol reactivity and delayed recovery (65).

Consistent with findings from studies that have utilized subjective reports of emotion dysregulation, evidence suggests that physiological markers of emotion dysregulation are related to involvement in risky behaviors. In general, this research has found risky behaviors to be positively associated with HRV [66, 67**,68], PEP [63], and cortisol reactivity [66,69*]. However, because this research is still in its infancy, several important questions remain. First, given evidence to suggest that the sympathetic and parasympathetic nervous

systems and the HPA axis can have antagonistic, synergistic, or independent effects [70,71], it is essential that research assess the role of multiple physiological indices of emotion dysregulation (and their interactions) in risky behaviors. Indeed, recent research suggests that concurrently low or high autonomic nervous system and HPA axis activation is associated with the highest levels of involvement in risky behaviors [72*,73]. It may be particularly important to explicate the role of physiological markers of emotion dysregulation in response to specific emotions (versus aggregating negatively and positively valenced emotions), as autonomic nervous system and HPA axis reactivity have been shown to be uniquely associated with anger and sadness, respectively [74]. Second, much of the research to date has focused on resting and/or peak levels of emotional responding and reactivity in risky behaviors; however, AK Santucci, et al. [75*] found that longer duration of autonomic nervous system activation following a frustrating task, but not autonomic nervous system reactivity, was associated with emotion dysregulation. This finding suggests that (a) the inability to down-regulate autonomic nervous system activity may be a better marker of emotion dysregulation than simply the level of autonomic arousal, and (b) the need for investigations of the role of autonomic nervous system recovery in risky behaviors. Finally, as previously noted, it will be important for future research to identify the context-dependent role of physiological processes related to emotion dysregulation and their relation to risky behaviors. Indeed, initial evidence suggests that autonomic nervous system reactivity differs as a function of the stressor (cognitive versus interpersonal) [76*].

Implications for Treatment

While more nuanced investigations of the emotion dysregulation-risky behavior relation are needed, including those that elucidate the role of positive emotional experiences and include context-dependent and physiological assessments of emotion dysregulation and risky behaviors, existing research highlights the potential utility of targeting emotion dysregulation in treatments aimed at reducing risky behaviors. Consistent with the aforementioned basic research findings, results of clinical outcome studies suggest that treatments targeting emotion dysregulation result in reductions in risky behaviors. For instance, Dialectical Behavior Therapy (DBT) [77] incorporates a wide range of skills (e.g., emotion regulation, distress tolerance, mindfulness) that target emotion dysregulation and has been shown to result in reductions in risky behaviors, including deliberate self-harm [78], disordered eating [79], and substance use [80]. Likewise, KL Gratz and MT Tull [81] have found that a brief, adjunctive emotion regulation group therapy (ERGT) for women with borderline personality disorder can reduce deliberate self-harm, as well as various forms of risky behaviors (e.g., binge eating, substance use, risky sex), by focusing specifically on improving emotion regulation [82]. Future research would benefit from exploring the effect of treatments targeting emotion dysregulation, such as DBT and ERGT, in reducing risky behaviors among more diverse populations.

Conclusions

Theoretical and empirical literature provide growing support for the underlying role of emotion dysregulation in a wide range of risky behaviors. While advancing our understanding of the emotion dysregulation-risky behavior relation, findings from extant

investigations have largely been limited through the use of correlational designs and self-report data to identify the role of difficulties regulating negative emotions in risky behaviors. However, emerging research has begun to address these limitations. First, while research on the regulation of emotions has overwhelmingly focused on negative emotional experiences, recent investigations have begun to provide support for the role of specific domains of difficulties regulating positive emotions (i.e., positive urgency and emotion differentiation) in risky behaviors, suggesting the utility of targeting difficulties regulating positive emotions in interventions aimed at reducing risky behaviors. Second, research to date has generally assessed dispositional tendencies towards emotion dysregulation and retrospective reports of risky behaviors; however, there is evidence for the context-dependent nature of both emotion dysregulation and risky behaviors. Finally, growing research highlights the role of physiological processes underlying the ability to regulate emotions, such as HRV and cortisol reactivity, in risky behaviors. These advancements can improve our understanding of the ways in which emotion dysregulation may increase motivations to engage in risky behaviors, as well as inform the development and refinement of more efficacious interventions for reducing risky behaviors.

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dissociation). Further, overall difficulties in regulating positive emotions and difficulties controlling behavior when experiencing positive emotions were negatively correlated with emotional expressivity, and difficulties engaging in goal-directed behavior when experiencing positive emotions was positively associated with the expression of negative emotions. Finally, greater nonacceptance of positive emotions was associated with greater difficulties regulating negative emotions, greater emotional neglect, and lower levels of general emotional expressivity. Taken together, findings provide evidence for the validity of the DERS-Positive total and subscales scores.]

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High Regulators, whereas both *Adaptive* and *Low Regulators* reported lower psychopathology than the *Maladaptive Regulators*. Findings of this study provide support for the context-dependent role of repertoires of emotion regulations strategies.]

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residential treatment for alcohol dependence. Participants were inpatients with an alcohol use disorder who were randomly assigned to participate in 10 weeks of either a mindfulness-oriented therapy or an addiction support group. Following treatment, attentional bias for alcohol cues and affect-modulated cue-reactivity (i.e., induced using IAPS alcohol-related pictures) were assessed while heart rate was recorded. Relapse (yes/no) was assessed 6-months post-treatment. HFHRV cue-reactivity and alcohol attentional bias were found to predict the occurrence and timing of relapse. HFHRV reactivity to alcohol cues was significantly higher among inpatients who relapsed compared with inpatients who did not relapse. Findings of this study highlight the role of HFHRV and attentional bias to alcohol cues in alcohol use following treatment for alcohol dependence.]

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Vagal tone was assessed pre-, during-, and post-emotional challenge. Mother's rated children's levels of effortful control and negative affectivity. Post-challenge vagal tone and negative affectivity were associated with children's maladaptive strategies during the frustrating task. Results of this study provide support for the role of emotional recovery, but not reactivity, in maladaptive emotion regulation strategies.]

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Highlights

- Emotion dysregulation has been implicated in the pathogenesis of risky behaviors
- Difficulties regulating negative *and* positive emotions are related to risky behaviors
- Emotion dysregulation and risky behaviors are context-dependent
- Physiological markers of emotion dysregulation are related to risky behaviors
- Treatments targeting emotion dysregulation result in a reduction in risky behaviors