



Emotion dysregulation and smoking among treatment-seeking smokers

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HIGHLIGHTS

- Evaluate multidimensional facets of emotion dysregulation and the smoking.
- Emotion dysregulation may be an important treatment target for changing smoking.
- Emotion dysregulation global score was significantly related with smoking dependent variables.

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ABSTRACT

Introduction: There has been increased scholarly interest in advancing the study of emotion dysregulation and substance use. However, there is limited study of emotion dysregulation in the context of smoking. The current study examined the emotion dysregulation global construct and sub facets in relation to negative affect reduction expectancies, coping motives, perceived barriers for quitting, and the severity of problems experienced during quit attempts.

Method: Treatment seeking smokers ($n = 469$; 48.2% female, $M_{age} = 36.59$, $SD = 13.58$) enrolled in a smoking cessation trial and completed baseline measures of smoking cognitions and emotion dysregulation.

Results: Results indicated that the emotion dysregulation global score was significantly associated with each of the smoking dependent variables. Additionally, difficulty accessing emotion regulation strategies and difficulty engaging in goal-directed behavior were significantly associated with the dependent variables.

Conclusion: Overall, this is the first study to evaluate relations between multidimensional facets of emotion dysregulation and clinically relevant smoking variables. Emotion dysregulation may be an important treatment target for changing smoking.

1. Introduction

There has been increased scholarly interest in forwarding the scientific study of emotion dysregulation (Barlow, Allen, & Choate, 2004; Gross & Muñoz, 1995; Kashdan & Steger, 2006). Theory and study have converged on the idea that emotion dysregulation involves multiple difficulties in emotional functioning and regulation (Cole, Michel, & Teti, 1994; Mennin, 2004; Mennin, Heimberg, Turk, & Fresco, 2005). Such perspectives denote that emotion dysregulation reflects difficulties in the self-regulation of emotional states and difficulties in self-control over emotion-driven behaviors (Carver, Lawrence, & Scheier, 1996; Gross, 1998). As operationalized and measured by the most well-known and commonly used self-report measure of emotion dysregulation, the

Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004), the construct maintains a higher-order structure involving a global factor and multiple, internally consistent sub-facets which include difficulties relevant to an individual's (1) acceptance of emotional responses (2), ability to engage in goal-directed behavior under distress (3), ability to control impulsive behaviors when distressed (4), awareness of emotional experiences (5), access to emotion regulation strategies, and (6) emotional clarity.

Emotion dysregulation (as a higher-order construct) is related to increased levels of negative affect (Brandt, Johnson, Schmidt, & Zvolensky, 2012; Vujanovic, Zvolensky, & Bernstein, 2008), including depression (Bradley, DeFife, Guarnaccia, et al., 2011), anxiety (Vujanovic et al., 2008), and aggression (McLaughlin, Hatzenbuehler,

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Mennin, & Nolen-Hoeksema, 2011). Emotion dysregulation is also associated with avoidance-oriented coping (Bonn-Miller, Vujanovic, & Zvolensky, 2008), lower self-efficacy for changing health behaviors (Rellini, Zvolensky, & Rosenfield, 2012), and substance use (Axelrod, Perepletchikova, Holtzman, & Sinha, 2011). In the context of negative affect (borderline personality disorder, PTSD, childhood abuse), increased emotion dysregulation has been found to confer risk for illicit substance use (Axelrod et al., 2011; Barahmand, Khazaei, & Hashjin, 2016; Tull et al., 2016). In terms of smoking, emotion dysregulation may be particularly important, as individuals smoke to reduce negative affect, and report increased (appetitive) mood following smoking (Carter, Lam, Robinson, et al., 2008). Available studies in smoking suggest the global emotion dysregulation construct is related to greater attentional bias to smoking cues (Fucito, Juliano, & Toll, 2010), increased craving to smoke (Szasz, Szentagotai, & Hofmann, 2012), decreased quit success, and early smoking lapse (Farris, Zvolensky, & Schmidt, 2016). Therefore, emotion dysregulation may be important to understanding quit success or failure. As negative affect is a key symptom of withdrawal (Zinser, Baker, Sherman, & Cannon, 1992), difficulty regulating affect would theoretically increase the likelihood of maladaptive (addictive) behaviors to further reduce negative affect, such as smoking. These initial data collectively highlight the potentially important role of emotion dysregulation in a wide array of clinical-relevant smoking processes.

To date, nearly all previous work on emotion dysregulation has focused on the higher-order emotion dysregulation factor. Of the available work in substance use focused on emotion dysregulation sub-facets, the lack of ability to control impulsive behaviors when distressed was found to partially explain the relationship between post-traumatic stress disorder (PTSD) symptoms and cocaine use (Tull et al., 2016), whereby symptoms of PTSD were associated with poorer impulsive control behaviors when distressed, leading to increased cocaine use. Further emotion dysregulation also explained the relationship between childhood abuse and PTSD symptoms in a sample of substance abusers (Weiss, Tull, Lavender, & Gratz, 2013), suggesting that emotion dysregulation may be a risk factor for both increased negative affect, as well as increased substance use. Additionally, in a study examining emotion dysregulation and risky behaviors (e.g., disordered eating, deliberate self-harm, substance use), all sub facets of emotion dysregulation were elevated among those engaging in more than one risky behavior compared to those engaging in either one or no risky behaviors (Buckholdt, Parra, Anestis, et al., 2015). Emotional non-acceptance has also been found to be significantly related to cannabis use coping motives among current cannabis users (Bonn-Miller et al., 2008). These results highlight the importance of elevated emotion dysregulation sub-facets contributing to illicit substance use behaviors, particularly in the context of negative affect.

In terms of smoking, research on emotion dysregulation sub-facets is particularly limited. In one study, emotional non-acceptance partially explained the relationship between depressive symptoms and recent cigarette smoking status (Adams, Tull, & Gratz, 2012). Additionally, a review of the literature suggests the increasing emotional acceptance specifically may aid in preventing smoking relapse (Carmody, Vieten, & Astin, 2007). However, little research has examined aspects of emotion dysregulation that may contribute to smoking maintenance and relapse, and there is a clear need for research to better understand emotion dysregulation facets and their potential unique roles in smoking. Indeed, these facets allow for a fine-grained examination of specifically how emotion dysregulation contributes to smoking variables, such as negative affect reduction expectancies and problems associated with quitting (Yang, Zvolensky, & Leyro, 2017). Moreover, none of the past work on emotion dysregulation facets in smoking, or substance use in general, has modeled the facets together in one overarching model. Therefore, it is presently unclear how specific facets of this construct relate to specific substance use processes while considering their shared variance between one another.

The purpose of the present investigation was to examine how emotion dysregulation, as well as its six sub facets, were associated with clinically significant smoking variables. Specifically, we hypothesized that the emotion dysregulation global construct would be related to negative affect reduction expectancies (Brandon, 1994), coping motives (Ikard, Green, & Horn, 1969), perceived barriers for quitting (Macnee & Talsma, 1995), and the severity of problems experienced during quit attempts (Brown, Lejuez, Kahler, & Strong, 2002). Additionally, based on the limited literature examining emotion dysregulation sub facets in smoking, it was hypothesized that emotional non-acceptance would be related to each of the dependent variables. For all models, it was hypothesized that any emotion dysregulation effects (global construct or sub facets) would be observed over and above the effects of commonly used covariates: gender, cigarette dependence, current alcohol use problems, Axis 1 psychopathology, and smoking-related health problems (Bakhshaei, Zvolensky, Allan, Vujanovic, & Schmidt, 2015).

2. Method

2.1. Participants

Participants ($N = 469$) were treatment seeking adult daily smokers (48.2% female, $M_{age} = 36.59$, $SD = 13.58$) enrolled in a clinical trial for smoking cessation and anxiety sensitivity. Regarding ethnicity, 85.3% of participants identified as White, 8.4% as Black, 3.3% as Hispanic, 1.1% as Asian, and 2.5% as “other.” On average, participants smoked 16.6 ($SD = 9.96$) cigarettes per day in the week prior to beginning the study, reported an average lifetime use of 16.88 ($SD = 9.04$) cigarettes per day, and reported a moderate level of nicotine dependence (Fagerström Test for Cigarette Dependence: $M = 5.5$, $SD = 2.29$). Additionally, participants reported, on average, starting smoking at age 14.87 years ($SD = 3.44$), becoming a regular daily smoker at age 17.40 years ($SD = 3.76$), and reported 18.33 ($SD = 13.36$) years of being a daily smoker. Additionally, 44% of participants met criteria for at least one Axis 1 psychological disorder, as assessed by the Structured Clinical Interview for DSM-IV-Non-Patient Version (First, Spitzer, Gibbon, & Williams, 2007).

2.2. Measures

2.2.1. Demographics

Participants completed a demographic form capturing gender and age.

2.2.2. Structured Clinical Interview for DSM-IV-Non-patient Version (SCID-N/P) (First et al., 2007)

Diagnostic exclusions and prevalence/incidence of current (past month) Axis I diagnoses were assessed via the SCID-NP (First et al., 2007), including emotional disorders and substance use disorders. The interviews were administered by trained staff and supervised by independent doctoral-level psychologists. All interviews were audiotaped and the reliability of a random selection of approximately 12.5% of interviews were checked (MJZ) for accuracy; no cases of diagnostic coding disagreement were noted. Axis I diagnosis was coded in a binary fashion (coded: 0 = absent and 1 = present).

2.2.3. Fagerström Test for Cigarette Dependence (FTCD) (Fagerström, 2012)

The FTCD is a 6-item scale that assesses gradations in tobacco dependence (e.g., “how soon after you wake up do you smoke your first cigarette”) (Fagerström, 2012; Heatherton, Kozlowski, Frecker, & Fagerström, 1991). Scores range from 0 to 10, with higher scores reflecting increased levels of physiological dependence on cigarettes. The FTCD has adequate internal consistency, positive relations with key smoking variables (e.g., saliva cotinine), and high test-retest reliability (Heatherton et al., 1991; Pomerleau, Carton, Lutzke, Flessland, &

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