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Linkages between cigarette smoking outcome expectancies and negative emotional vulnerability

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ABSTRACT

The present investigation examined whether smoking outcome expectancies, as measured by the Smoking Consequences Questionnaire (SCQ; [Brandon, T.H., & Baker, T.B., (1991). The Smoking Consequences Questionnaire: The subjective expected utility of smoking in college students. Psychological Assessment, 3, 484–491.]), were incrementally related to emotional vulnerability factors among an adult sample of 202 daily cigarette smokers (44.6% women; M_{age}=23.78 years, SD=9.69 years). After controlling for cigarettes smoked/day, past 30-day marijuana use, current alcohol consumption, and coping style, negative reinforcement/negative affect reduction outcome expectancies were significantly associated with greater levels of negative affectivity, emotional dysregulation, and anxiety sensitivity. The observed effects for negative reinforcement/negative affect reduction also were independent of shared variance with other outcome expectancies. Negative personal consequences outcome expectancies were significantly and incrementally related to anxiety sensitivity, but not negative affectivity or emotional dysregulation. Findings are discussed in terms of the role of negative reinforcement/negative affect reduction smoking outcome expectancies and clinically-relevant negative emotional vulnerability for better understanding cigarette smoking-negative mood problems.

1. Introduction

There is a recent and increasingly well-documented association between cigarette smoking and depressive and anxiety symptoms and disorders (Morrell & Cohen, 2006; Morissette, Tull, Gulliver, Kamholz, & Zimering, 2007; Patton et al., 1998). Indeed, epidemiological (Grant, Hasin, Chou, Stinson, & Dawson, 2004; Lasser et al., 2000), community (Hayward, Killen, & Taylor, 1989) and clinical (Himle, Thyer, & Fischer, 1988; McCabe et al., 2004; Pohl, Yeragani, Balon, Lycaki, & McBride, 1992) studies have found that daily cigarette smoking is more common among those with anxiety and depressive psychopathology compared to those without such problems. Other studies have found that smoking, particularly at higher rates, increases the risk for developing and maintaining clinically-significant anxiety and depressive symptoms (Breslau & Klein, 1999; Breslau, Novak, & Kessler, 2004; Goodwin, Lewinsohn, & Seeley, 2005; Isensee, Wittchen, Stein, Höfler, & Lieb, 2003; Johnson et al., 2000; Korhonen et al., 2007; McLeish, Zvolensky, & Bucossi, 2007; Steuber & Banner, 2006). There is also evidence to suggest daily smokers experiencing high levels of anxiety and/or depressive symptoms tend to experience more severe withdrawal sensations (Breslau, Kilbey, & Andreski, 1992), resulting in more difficult and less successful quit attempts (Anda et al., 1999; Zvolensky et al., in press). Such findings demonstrate the clinically-significant relations between negative emotional vulnerability and tobacco use.

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Although extant research linking cigarette smoking and negative emotional vulnerability problems is persuasive, there is far less empirical information pertaining to the explanatory relevance of *outcome expectancies* for cigarette smoking (beliefs about the effects of smoking; Brandon, Juliano, & Copeland, 1999) in regard to the experience of negative emotional states. Outcome expectancies reflect anticipated consequences of smoking (Brandon, 1994; Brandon et al., 1999; Cohen, McCarthy, Brown, & Myers, 2002; Cox & Klinger, 1988; Niaura, Goldstein, & Abrams, 1991) and include beliefs about positive reinforcement (e.g., "I enjoy the taste sensations while smoking"), negative reinforcement/negative affect reduction (e.g., "Smoking helps me calm down when I feel nervous"), negative consequences (e.g., "The more I smoke, the more I risk my health"), and appetite control (e.g., "Smoking helps me control my weight"; Brandon & Baker, 1991). Outcome expectancies are related to key aspects of smoking behavior (Kelemen & Kaighobadi, 2007). For instance, smokers who smoke at higher rates tend to endorse more positive expectancies about the effects of smoking (Ahijevych & Wewers, 1993; Copeland, Brandon, & Quinn, 1995; Downey & Kilbey, 1995), whereas expectancies for negative reinforcement/negative affect reduction predict greater rates of smoking cessation failure (Wetter et al., 1994). Other work suggests simply believing that smoking reduces negative affect is sufficient to reduce negative affect even in the absence of a direct pharmacological effect (Juliano & Brandon, 2002). Overall, smoking expectancies are important because they are predictive of smoking behavior and are self-fulfilling.

Linkages between smoking outcome expectancies and anxiety and depressive states have received little scientific attention. To date, research has focused predominately on the association between anxiety-related traits (individual differences in anxiety vulnerability) and smoking outcome expectancies. Among college and community-recruited daily adult smokers, for example, anxiety sensitivity (fear of the expected negative consequences of anxiety symptoms; McNally, 2002) is related to negative reinforcement/negative affect reduction expectancies for smoking and negative personal consequences expectancies (Brown, Kahler, Zvolensky, Lejuez, & Ramsey, 2001; Gregor, Zvolensky, McLeish, Bernstein, & Morissette, 2008; Leyro, Zvolensky, Vujanovic, & Bernstein, in press; Zvolensky, Feldner et al., 2004). In a study of college students, McChargue, Spring, Cook, & Neumann (2004) found that smokers' expectations about the positively reinforcing effects of smoking (e.g., increases pleasure), but not the negatively reinforcing effects (e.g., reduces negative mood), mediated the association between smoking status and lifetime major depression. These findings, albeit limited in overall scope, collectively indicate that individual differences in anxiety and depressive factors may be relevant to certain outcome expectancies among adult smokers.

Integrative models of the co-occurrence of smoking-anxiety and depressive relations posit that negative reinforcement/negative affect reduction expectancies among smokers, in particular, may be strongly related to negative emotional vulnerability (Morissette et al., 2007; Zvolensky & Bernstein, 2005; Zvolensky, Schmidt, & Stewart, 2003). These predictions are informed by self-regulation theory and stress-coping perspectives of substance use (Abrams & Niaura, 1987; Baker, Piper, McCarthy, Majeskie & Fiore, 2004; Shiffman & Wills, 1985). That is, among certain daily smokers, smoking serves important perceived affect regulatory functions (Comeau, Stewart, & Loba, 2001; Novak, Burgess, Clark, Zvolensky, & Brown, 2003; Stewart, Karp, Pihl, & Peterson, 1997; Zvolensky, Bonn-Miller, Bernstein & Marshall, 2006). Those individuals who expect tobacco use to help alleviate aversive affective states (Zvolensky, Feldner et al., 2004) may be particularly motivated to smoke for affect regulation purposes (Brown et al., 2001). Although the objective physiological and subjective mood-dampening qualities of smoking are complex (Kassel, Stroud, & Paronis, 2003), in the absence of other more adaptive coping strategies, such persons may learn to rely on smoking to manage negative mood states in the short-term. Moreover, as such individuals repeatedly smoke to reduce nicotine withdrawal symptoms (e.g., shakiness, anxiety), they may learn to rely on smoking to manage anxiety and related emotional states in other situations (Parrot, 1998). This type of smoking behavior may ultimately contribute to beliefs (negative affect reduction expectancies) that smoking is a personally powerful self-regulation strategy for managing negative affect states such as anxiety and depression (Brandon et al., 1999; Juliano & Brandon, 2002). Smoking outcome expectancies may thus play an important role in the maintenance of smoking behavior and/or negative emotional vulnerability for individuals with affect regulatory smoking-relevant expectancies.

Overall, theory and empirical research on outcome expectancies would suggest that simply *believing* smoking could be used as an effective response strategy for managing aversive emotional states may serve to confer risk for negative emotional vulnerability (Kirsch, 1985). Indeed, the expectancy that one can effectively regulate or cope with negative mood – not specific to smoking or other forms of substance use – is a consistent predictor of concurrent and prospective anxious and depressed mood (Catanzaro & Greenwood, 1994; Catanzaro, Horaney, & Creasey, 1995; Kassel, Bornovalova, & Mehta, 2007; Kirsch, Mearns, & Catanzaro, 1990; Mearns & Cain, 2003). Extended to cigarette smoking, holding the belief that smoking can reduce negative affect may be related to greater negative emotional vulnerability among smokers for two non-mutually exclusive reasons. First, these persons may simply have less self-confidence (or self-efficacy) in their ability to successfully manage stressors without smoking (regardless of actual coping skills). And second, they may have less opportunity to learn and practice other more adaptive coping skills for dealing with such affect-relevant stressors (Kirsch, 1985). This type of explanatory account would suggest that negative reinforcement/negative affect reduction expectancies may offer unique explanatory value in terms of understanding negative emotional vulnerability; such that, those persons that hold the strongest beliefs that smoking will yield emotional benefits in terms of alleviating negative mood may come to rely solely on tobacco as a mood management technique. In the absence of other adaptive coping strategies, this subgroup of smokers may be a particularly at-risk population with regard to emotional disturbances such as more intense and problematic (dysregulated) anxiety and depressive symptoms.

Together, the overarching aim of the present investigation was to evaluate the incremental validity of specific, theoretically-relevant smoking outcome expectancies in predicting negative emotional vulnerability factors in a community-recruited sample of adult daily smokers. Based upon basic outcome expectancy theory (Kirsch, 1985), it was hypothesized that expectancies for negative reinforcement/negative affect reduction would be significantly and uniquely positively related to emotional dysregulation (difficulties in regulating emotional states), a greater tendency to experience negative affect symptoms (negative affectivity), and