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Empirical Research

The role of smoking-specific experiential avoidance in the relation between perceived stress and tobacco dependence, perceived barriers to cessation, and problems during quit attempts among treatment-seeking smokers



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ABSTRACT

Despite the clinically-significant association between perceived stress and smoking, there is little understanding of the mechanisms underlying this relation. The present study examined smoking-specific experiential avoidance as an explanatory mechanism linking perceived stress and smoking, including nicotine dependence, perceived barriers to cessation, and problems reported during past quit attempts among treatment-seeking daily smokers ($n=365$; 48.5% female; $M_{age}=38.02$; $SD=13.10$). Results indicated that smoking-specific experiential avoidance had a significant, indirect effect on perceived stress and the studied smoking criterion variables. The present findings provide initial empirical support that smoking-specific experiential avoidance may help explain how perceived stress is associated with smoking. These data suggest that there may be merit to targeting smoking-specific experiential avoidance during smoking cessation among smokers with elevated perceived stress.

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1. Introduction

There is a long-standing interest in the interconnection between stress and substance use behavior (Sinha, 2001). Clinical reports, epidemiologic sources, and laboratory investigations converge on a consistent and robust association between elevated objective and subjective indices of stress and substance use and relapse (Brewer, Catalano, Haggerty, Gaaney, & Fleming, 1998; Sinha, 2001).

Although numerous types of stress have been studied, Lazarus, and Folkman (1984) posit that the most critical element of an event's impact is how it is appraised. Specifically, the degree to which an individual evaluates an event in terms of its significance (primary appraisal) and his/her ability to effectively deal with it (secondary appraisal) largely determines whether the event produces a negative (emotional) response (Cohen, Kamarck, & Mermelstein, 1983). In line with this perspective, research suggests perceived stress, defined as the degree to which individuals experience life events as unpredictable, uncontrollable, or generally

overloading (Cohen et al., 1983), is associated with greater negative emotional reactivity (Zvolensky et al., 2002) as well as avoidant coping (Soderstrom, Dolbier, Leiferman, & Steinhardt, 2000). It is important to highlight that while some work conceptualizes perceived stress and negative affect as a uni-dimensional construct (Cohen, Tyrrell, & Smith, 1993; Watson, 1988; Watson, & Clark, 1992), they are theoretically distinct. Specifically, perceived stress taps into the stress appraisal process by considering one's coping resources (Cohen et al., 1983), whereas negative affect pertains to the emotional states, regardless of coping resources (Kassel, Stroud, & Paronis, 2003). Therefore, perceived stress is theoretically more of a multifaceted construct that captures influences of stress appraisal that may not be captured by negative affect.

There is also an established relation between perceived stress and smoking, presumably due to its relation to affective processes and their regulation. For example, current smokers report higher levels of perceived stress than nonsmokers (Ng, & Jeffery, 2003) as well as smokers who are able to quit successfully (Carey, Kalra, Carey, Halperin, & Richards, 1993; Cohen, & Lichtenstein, 1990). Higher perceived stress is also related to higher levels of nicotine dependence (Leung, Lam, & Chan, 2010), less confidence to refrain from smoking (Leung et al., 2010; Ng, & Jeffery, 2003), and lower odds of quit success and less time to relapse (al'Absi, Hatsukami, &

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Davis, 2005). In fact, perceived stress is commonly cited as a key barrier to cessation (Tsourtos, & O'Dwyer, 2008). These data collectively indicate that perceived stress is related to several aspects of smoking, but the mechanisms by which perceived stress relates to smoking remain unclear.

One possible mechanism that may help elucidate the perceived stress-substance use relation is experiential avoidance. Experiential avoidance reflects an unwillingness to experience or remain in contact with aversive internal experiences and attempt to control the frequency or form of the experiences and the contexts in which they occur (Hayes et al., 2004). Experiential avoidance related to smoking is associated with increased odds of quit failure (Gifford et al., 2004), perceived barriers to cessation (Zvolensky, Farris, Schmidt, & Smits, 2014), and mood-management motives and nicotine dependence (Farris, Zvolensky, Norton et al., in press). Within the context of smoking cessation treatment, smoking-specific avoidance mediates the relation between treatment condition and smoking outcomes (Gifford et al., 2011). Additionally, during the course of smoking cessation treatment, smoking-specific experiential avoidance is related to more severe nicotine withdrawal, craving, and poorer quit-day success (Farris, Zvolensky, & Schmidt, 2014). Importantly, experiential avoidance is related to, but empirically distinct from, other cognitive constructs linked to smoking including distress tolerance (Schloss, & Haaga, 2011), coping (Karekla, & Panayiotou, 2011), and negative affect (see Hildebrandt, & Hayes, 2012). Specifically, although these constructs generally focus on how individuals relate and respond to emotional experiences, experiential avoidance tends to emphasize rigidly avoiding uncomfortable thoughts, feelings, and bodily sensations associated with internal experiences.

It is presently unknown if smoking-specific experiential avoidance explains the relation between perceived stress and smoking. Research suggests individual differences in mood amplifying factors (e.g., worry, anxiety sensitivity) indirectly relates to greater barriers to cessation, number of prior quit attempts, and greater mood-management smoking expectancies through smoking-specific experiential avoidance (Farris, Zvolensky, Norton et al., in press; Zvolensky et al. 2014). These findings invite further empirical exploration of the role of smoking-specific experiential avoidance in other mood-modulating constructs such as perceived stress. It may be that smokers with greater levels of perceived stress perceive life events and internal sensations as more personally distressing (Zvolensky et al., 2002). Accordingly, these smokers may be more apt to respond to such distress with escape/avoidance, and therefore, use smoking as a means to attenuate their distress (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004). This behavior, in turn, may be related to more severe or problematic smoking behavior (e.g., greater levels of dependence, more perceived obstacles to quitting, and more problems during quit attempts).

The present study evaluated whether smoking-specific experiential avoidance, in part, explains the relation between perceived stress and nicotine dependence, perceived barriers to cessation, and severity of problematic symptoms during past quit attempts among treatment-seeking smokers (see Fig. 1). These smoking variables represent a wide array of smoking processes related to quit history and maintenance of cigarette use, which consistently are related to poorer treatment outcome (Cosci et al., 2009; Ockene et al., 2000; Schnoll et al., 2011). It was hypothesized that perceived stress would have an indirect effect on smoking variables through experiential avoidance.

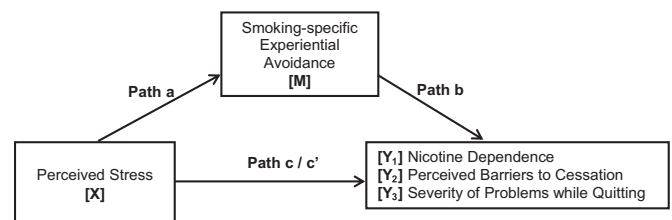


Fig. 1. Smoking-specific experiential avoidance as an indirect explanatory variable for perceived stress and smoking. Note: a=effect of X on M; b=effect of M on Y_i; c=total effect of X on Y_i; c'=direct effect of X on Y_i controlling for M; a*b=indirect effect of M; three separate models were conducted, one for each criterion variable (Y₁₋₃). Covariates included gender, axis I disorder, and PANAS-NA=positive and negative affect schedule-negative affect subscale (Watson, Clark, & Tellegen, 1988).

2. Methods

2.1. Participants

Adult daily smokers were recruited from the community to participate in a randomized controlled dual-site clinical trial examining the efficacy of two smoking cessation interventions. The sample consisted of 365 treatment-seeking adult daily smokers (48.7% female; $M_{\text{age}}=38.06$; $SD=13.11$; age range: 18–65 years) who had an expired carbon monoxide level at baseline of at least 8 ppm (ppm; Jarvis, Tunstall-Pedoe, Feyerabend, Vesey, & Saloojee, 1987) and at least one serious lifetime quit attempt, as indexed by the Smoking History Questionnaire (Brown, Lejuez, Kahler, & Strong, 2002). Exclusion criteria included current suicidality and psychosis. See Table 1 for the sample characteristics.

3. Measures

3.1. Primary predictor variable

3.1.1. Perceived stress scale (PSS)

Perceived stress scale (Cohen et al., 1983) assessed perceived stress. PSS is a 14-item scale that measures the degree to which situations in one's life is appraised as stressful during the past month on a 0 (*never*) to 4 (*very often*) scale. The PSS has good internal consistency ($r=.84-.86$) and test-retest reliability ($r=.85$; Cohen et al., 1983). In the present study, the PSS total score was utilized (Cronbach's $\alpha=.86$).

3.1.2. Avoidance and inflexibility scale (AIS)

The AIS assessed smoking-specific experiential avoidance and inflexibility (Gifford et al., 2004). Participants respond to 13-items according on a 1 (*not at all*) to 5 (*very much*) scale. Higher scores represent more smoking-specific avoidance or inflexibility in the presence of uncomfortable or difficult sensations or thoughts, whereas lower scores suggest more ability to accept difficult feelings or thoughts without allowing them to trigger smoking. Past work found good convergent and predictive validity of the AIS for smoking processes (Farris, Zvolensky, DiBello, & Schmidt, in press). The total score was utilized in the current study (Cronbach's $\alpha=.93$).

3.2. Dependent measures

3.2.1. Fagerström test for nicotine dependence (FTND)

The FTND is a 6-item scale that assesses gradations in tobacco dependence (Heatherton, Kozlowski, Frecker, & Fagerström, 1991). Higher scores reflect high levels of physiological dependence on nicotine. The FTND has adequate internal consistency, positive relations with key smoking variables (e.g., saliva cotinine), and

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