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Sustained smoking abstinence is associated with reductions in smoking-specific experiential avoidance among treatment-seeking smokers

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ABSTRACT

Background and objectives: Smoking-specific experiential avoidance is related to the maintenance of cigarette smoking. However, it is unclear whether sustained smoking abstinence is associated with subsequent reductions in smoking-specific experiential avoidance.
Methods: Daily smokers (n = 149) underwent a cessation attempt in the context of a 4-session smoking cessation treatment trial. Participants provided biochemical verification of smoking status at 1 week, 2 weeks, and 1 Month post-quit day. Smoking-specific experiential avoidance was assessed per the Avoidance and Inflexibility Scale (AIS) – the total score and two factor scores were examined at 1 Month post-quit day as a function of abstinence status. Two path models were conducted and included participant sex, treatment condition, and pre-cessation nicotine dependence, smoking-specific experiential avoidance, and presence of emotional disorders as covariates.
Results: After adjusting for covariates, sustained smoking abstinence was associated with a reduction in the AIS total score at Month 1 post-quit ($\beta = -.45$, $p < .001$). Sustained smoking abstinence was associated with reductions across both facets of experiential avoidance – smoking-related thoughts and feelings ($\beta = -.44$, $p < .001$) and internal bodily sensations ($\beta = -.41$, $p < .001$).
Limitations: Biochemical verification of smoking status was confirmed only at three time points post-quit day, and continued abstinence throughout the one-month post-quitting period is not fully known.
Conclusions: Sustained smoking abstinence may contribute to reductions in smoking-specific experiential avoidance. Findings add to the research documenting the relevance of experiential avoidance in various processes of smoking (including smoking abstinence).

Experiential avoidance reflects an unwillingness to experience or remain in contact with uncomfortable or aversive internal experiences (e.g., thoughts, emotions, memories, bodily sensations, images; Hayes et al., 2004; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). This emotion-regulatory process is posited to play a foundational role in the development and maintenance of various forms of psychopathology (for review, see Chawla & Ostafin, 2007) and various problem health behaviors, including diabetes, obesity, and chronic pain (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007; Lillis & Hayes, 2008; McCracken & Dhingra, 2002).

Recent work has also implicated experiential avoidance in the context of smoking – termed smoking-specific experiential avoidance (Gifford et al., 2004). This construct is characterized by

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avoidance or an unwillingness to experience distressing internal states *related to smoking* (e.g., thoughts about smoking, feelings associated with smoking, or internal bodily sensations like nicotine withdrawal). For example, a smoker who is distressed by smoking urges (e.g., intrusive thought of "I need a cigarette") may be particularly inclined to respond inflexibly to this thought or make attempts to avoid this thought, which may result in re-initiation of smoking. Theoretically, individual differences in the need to respond with action or to control distressing thoughts, feeling, or sensations related to smoking is associated with greater psychological inflexibility and may maintain smoking behavior. Indeed, higher levels of smoking-specific experiential avoidance are associated with greater reliance on cigarettes and affect-regulatory smoking outcome experiences (Farris, Zvolensky, DiBello, & Schmidt, 2015). Also, among anxious/depressed smokers, smoking-specific experiential avoidance indirectly accounts for smoking dependence characteristics (e.g., number of prior failed cessation attempts) and certain cognitive–affective processes (e.g., perceiving greater barriers to smoking cessation; Farris et al., 2014; Zvolensky, Farris, Schmidt, & Smits, 2014). Additionally, smoking-specific experiential avoidance is associated with greater negative affect, craving, and nicotine withdrawal at the initiation of smoking cessation treatment (Farris, Zvolensky, & Schmidt, 2015). Further, highly experientially avoidant smokers (relative to low) who also experience higher levels of internal distress while attempting to quit smoking (e.g., negative affect, physical withdrawal symptoms), are at an increased likelihood of smoking lapse following smoking cessation treatment (Minami, Bloom, Reed, Hayes, & Brown, 2015).

Reductions in experiential avoidance by quit day are also associated with increased likelihood of quit day abstinence, and are associated with lower levels of internal distress on quit day (Farris, Zvolensky, & Schmidt, 2015). A related corpus of work indicates that smoking cessation treatments that specifically target smoking-related psychological flexibility (e.g., acceptance and commitment-based therapies; ACT) are associated with better clinical outcomes (e.g., Bricker, Mann, Marek, Liu, & Peterson, 2010; Gifford et al., 2004; Hernández-López, Luciano, Bricker, Roales-Nieto, & Montesinos, 2009). In fact, ACT-based treatment effects may be driven by reductions in smoking-related experiential avoidance (i.e., increased willingness to experience distressing internal experiences linked to smoking without attempting to control them; Bricker, Wyszynski, Comstock, & Heffner, 2013; Gifford et al., 2004, 2011). Moreover, the effectiveness of non-ACT-based treatments appear to be related to increases in acceptance of craving (versus avoidance/control) and increased self-efficacy for quitting (Schuck, Otten, Kleinjan, Bricker, & Engles, 2014).

Theoretically, while experiential avoidance may maintain smoking behavior, it is possible that changes in smoking behavior may influence the degree to which individuals are willing to experience smoking-relevant internal distress (Nosen & Woody, 2014). For instance, quitting smoking often produces internal distress (e.g., withdrawal, negative mood); for a smoker who struggles to maintain abstinence and may have bouts of interoceptive distress, the internal experience may be viewed as "confirmatory evidence" that smoking-related experiences are unmanageable and best delimited. For instance, experimental data suggest that smokers who fail to quit smoking, relative to those who abstain, appraise craving-related thoughts as more negative and personally relevant/threatening, and these maladaptive appraisals are associated with higher levels of subjective nicotine withdrawal and psychological distress while attempting to quit (Nosen & Woody, 2014). Alternatively, a smoker who is successfully able to abstain from smoking may be more likely to appraise smoking-related internal experiences as inaccurate or discount the relevance and accuracy of these previously avoided internal experiences. Thus, some initial evidence suggests that acceptance of craving (one type of avoided smoking-relevant experience) may be promoted by successful smoking cessation.

The current study aimed to test the hypothesis that, following a smoking cessation intervention, those who achieved abstinence (for 1 month), relative to those who do not, would report lower experiential avoidance of distressing internal experiences that typically cue smoking (i.e., greater willingness/acceptance of experiences versus efforts to avoid/control experiences). Specifically, smoking abstinence status was examined in terms of its effect on experiential avoidance for both thoughts/feelings and physical bodily sensations that typically cue smoking, based on the factor-analytic findings that indicate differential predictive validity of these aspects of experiential avoidance (Farris et al., 2015). Additionally, based on findings that smoking-specific experiential avoidance is differentially related to sex, nicotine dependence, and psychopathology (Farris et al., 2015), the hypothesized effects of smoking abstinence on reductions in experiential avoidance were expected to be evident after adjusting for participant sex, severity of pre-quit levels of nicotine dependence, and presence of emotional disorders (anxiety, PTSD, depressive disorders). Finally, to account for pre-quit levels of smoking-specific experiential avoidance, and treatment condition, these effects were also adjusted for in the current analytic approach.

1. Methods

1.1. Participants

Participants in the current study were recruited from a larger smoking cessation and panic disorder prevention trial (clinicialtrials.gov #NCT01753141). Individuals participating in the parent trial were included based on being between the ages of 18–65 years, reporting smoking at least 8 cigarettes per day for at least one year, and motivation to quit of 5 or higher on a 10-point scale (higher ratings indicating higher motivation). Exclusion criteria included: current use of smoking cessation products or treatment, regular use of other tobacco products, unstable psychotropic medication use (participants had to be stable 3 + months), history of panic disorder (per the DSM-IV-TR), endorsement of past-month suicidality, a history of psychotic-spectrum disorders, current pregnancy or nursing, and inability to provide informed consent. The current study included data from a sub-set of the eligible (and enrolled) participants who were sampled based on (a) having available data for the measure of smoking-specific experiential avoidance at baseline (n = 259) and (b) having smoking outcome data available for at least two of three post-quit follow-up appointments (Week 1, Week 2, and/or Month 1; n = 160).

1.2. Measures

The ***Avoidance and Inflexibility Scale*** (AIS; Gifford et al., 2004) is a 13-item self-report measure of smoking-specific experiential avoidance. Respondents are first asked to rate how they respond to difficult thoughts, feelings (stress, fatigue, etc.), and bodily sensations (craving, withdrawal symptoms) that encourage smoking (e.g., "How likely is it these [thoughts/feelings/sensations] would lead you to smoke?", "How much are you struggling to control these [thoughts/feelings/sensations]?"). Responses are rated on a five-point Likert-scale ranging from "*not at all*" to "*very much/very likely*." Items are totaled, with higher scores reflecting less willingness, or more avoidance of (efforts to control) internal experiences that typically cue smoking (possible range 13–65). Exploratory factor analytic findings suggest the AIS comprises of