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Short Communication

The influence of personality traits on smokers' affect, withdrawal and cessation intervention outcome

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HIGHLIGHTS

- Smokers higher on harm avoidance had less baseline positive and more negative affect.
- Smokers higher on harm avoidance had more smoking withdrawal during the quit process.
- Harm avoidance was positively associated with end-of-treatment abstinence.

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ABSTRACT

The personality traits of harm avoidance (HA), novelty seeking (NS), and reward dependence (RD), as measured by the Tridimensional Personality Questionnaire (TPQ), have been linked to smoking behavior. The extent to which these traits are associated with smoking withdrawal and cessation outcome is unclear. We sought to address this question among 131 treatment-seeking smokers who were randomly assigned to either a smoking cessation treatment (four 30-min behavioral counseling sessions) or a control condition. We found that HA was positively associated with baseline depressive symptoms, baseline negative affect, and post-quit withdrawal, and negatively associated with positive affect at both baseline and post-quit. Additionally, we found that smokers with higher HA scores were more likely to be abstinent. NS was negatively associated with post-quit positive affect and positively associated with post-quit negative affect and withdrawal. RD was not found to be related to any outcome measures. Our findings suggest that, despite experiencing greater baseline and post-quit negative affect, smokers higher in trait harm avoidance are more likely to quit smoking. The treatment and theoretical ramifications of these findings are discussed.

1. Introduction

To improve smoking cessation rates, increasing efforts have been devoted to tailoring intervention to target risk factors that may predispose smokers to cessation failure (Ziedonis et al., 2008). One potential set of risk factors is personality traits that influence motivational behaviors that may be important in the development and maintenance of smoking behavior. The Tridimensional Personality Theory is a framework that describes personality variants (Cloninger, 1987) that have been postulated to influence various behavioral disorders, including substance abuse (Howard, Kivlahan, & Walker, 1997; Wills, Vaccaro, & McNamara, 1994). Specifically, this theoretical framework identifies three personality traits: harm avoidance (HA, the tendency to inhibit behaviors that may lead to harm), novelty seeking (NS, the tendency to activate approach behaviors in response to novel stimuli or cues for potential rewards), and reward dependence (RD, the tendency to maintain behaviors that are associated with rewards).

1.1. TPQ personality traits and smoking

1.1.1. Harm avoidance and smoking

HA has been found to be positively associated with smoking status. Daily smokers reported higher HA than never and former smokers, and more dependent smokers had higher HA scores than those less dependent (Etter, 2010). HA has been associated with smoking initiation risk, as Etter, Pelissolo, Pomerleau, and De Saint-Hilaire (2003) found that HA scores were lower in never-smokers than in ever-smokers. In line with this finding, neuroticism, a personality dimension highly correlated with HA (De Fruyt, Van De Wiele, & Van Heeringen, 2000), was positively associated with lifetime diagnosis of nicotine dependence (Kawakami, Takai, Takatsuka, & Shimizu, 2000).

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Some studies have found a relationship between HA and post-quit withdrawal symptoms, though the number of studies is few. Etter (2010) found that higher levels of HA predicted higher scores of depressed mood at 2-month post-quit. Related to this finding, smokers with higher HA reported more negative affect (NA) and urge to smoke to relieve distress in the condition of 12-h smoking abstinence compared to the ad libitum smoking condition (Leventhal et al., 2007).

1.1.2. Novelty seeking and smoking

NS has been positively associated with smoking status and acute withdrawal. Daily smokers were found to have higher NS scores than never smokers (Etter, 2010), and ever smoking was associated with higher NS scores than never smoking (Etter et al., 2003). NS was associated with smoking withdrawal in one study that found that smokers with higher NS reported greater levels of NA, withdrawal symptoms, and cigarette craving following 12-h smoking abstinence relative to smoking ad libitum (Leventhal et al., 2007). However, null findings have been also reported, as neither NS nor HA were found to be related to smoking-cue- or stress-induced cigarette cravings in one study (Michalowski & Erblich, 2014).

1.1.3. Reward dependence and smoking

RD has been positively associated with smoking status and cue-elicited smoking. Current smokers reported higher RD than former smokers (Etter et al., 2003). Smokers with higher RD scores reported stronger craving for smoking in response to smoking- and stress-related cues (Michalowski & Erblich, 2014). However, RD was not associated with withdrawal induced by 12-h smoking abstinence (Leventhal et al., 2007).

1.2. Present study

We used the Tridimensional Personality Questionnaire (TPQ; Cloninger, 1987) to measure HA, NS, and RD among smokers who were enrolled in a clinical cessation study involving brief smoking cessation psychotherapy (Lam et al., 2012). Our first aim was to determine to what extent these personality traits would be associated with smoking-related baseline characteristics. Based on the findings that HA and NS were positively correlated with behavioral activation and inhibition, respectively, and that behavioral activation and inhibition were positively associated with positive affect (PA) and NA, respectively (Carver & White, 1994), we hypothesized that HA would be positively associated with NA and negatively associated with PA, while NS would show the opposite associations. We also hypothesized that both HA and NS would be positively associated with nicotine dependence severity. Secondly, we evaluated the influences of these personality traits on post-quit affect and smoking withdrawal over the course of cessation treatment. In light of HA and NS's positive associations with acute smoking withdrawal symptoms (Leventhal et al., 2007), we hypothesized that higher HA and NS scores would be associated with less PA and more NA and withdrawal effects during the cessation course. Because of the sparsity of previous research on RD and smoking, we did not have specific hypotheses related to RD in our first two aims. Finally, we sought to determine to what extent these personality traits would predict end-of-treatment abstinence status. Based on previous research linking trait neuroticism and relapse (Hooten et al., 2005), we hypothesized that smokers with less HA scores would be more likely to be abstinent.

2. Methods

2.1. Participants

Participants were recruited from the Houston metropolitan area. The major inclusion criteria were: 1) intending to quit smoking, 2) smoking intensity ≥ 10 cigarettes per day (CPD), and 3) expired carbon monoxide (CO) ≥ 8 ppm. The major exclusion criteria were: 1) on psychotropic medications, 2) having psychiatric disorders, 3) non-nicotine substance abuse, and 4) involved in any other cessation treatment.

All participants provided informed consent. Participants' eligibility was verified by telephone screen and in-person enrollment session. The parent clinical study was approved by the Institutional Review Board at The University of Texas MD Anderson Cancer Center. The current study included 131 (female = 63) participants with an average age of 39.0 and smoking intensity of 20.9 CPD. Most were European (50%) or African (33%) American.

2.2. Procedures

Participants were randomly assigned to the intervention (n = 79) or control (n = 52) condition, though, due to a software problem, the groups were not randomized equally to the conditions. Nevertheless, these two groups did not differ in their baseline characteristics, such as age and gender.

All enrolled participants attended four laboratory sessions. Relative to the scheduled quit date (Day 0), the four sessions were on Days-5 to -4, Days 1–2, Days 3–5, and Days 10–14, respectively. Each session consisted of session questionnaires and CO verification, a picture viewing task, in which participants' physiological reactivity to emotional images was collected, and a 30-minute counseling session as the intervention treatment for the participants in the intervention group. Participants in the control condition continued to smoke and did not receive any treatment during the course of the study. The pertinent procedures and results have previously been reported in detail (Lam et al., 2012; Robinson et al., 2011).

The intervention outcome was continuous CO-verified abstinence status. Specifically, smokers who were able to maintain continuous abstinence during the 2-week post-quit period were coded as abstainers (n = 24). Those who had relapsed or never quit were defined as non-abstainers (n = 55).

2.3. Self-report questionnaires

We measured the personality traits of HA, NS, and RD using the TPQ (Cloninger, 1987), nicotine dependence using the Fagerström Test for Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerström, 1991), and PA and NA using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Depressive symptoms were captured using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) and smoking withdrawal symptoms using the Wisconsin Smoking Withdrawal Scale (WSWS; Welsch et al., 1999).

2.4. Statistical analyses

All statistical analyses were conducted using SAS software (v9.4; SAS Institute; Cary, NC, USA). Participants' baseline characteristics were evaluated with descriptive procedures. All inferential statistical models included age, sex, and race as covariates where applicable. The significance level was set as 0.05.

The relationships between baselines measures were assessed using Pearson product–moment correlations. We conducted mixed models analysis to identify the influence of the TPQ traits on post-quit affect and withdrawal among smokers in the intervention condition (7 of the 79 smokers randomized to the treatment condition who did not attend any post-quit sessions were excluded from these analyses). The dependent variables were affect (e.g., PANAS) and withdrawal (WSWS), and the independent variables included TPQ trait scores and time (i.e., laboratory session). We examined the main effects of TPQ traits on these variables while controlling for time. Then, to examine whether affect and withdrawal may change differently over time during cessation as a function of personality traits, we included the interaction