

BRIEF REPORT

The Role of Daily Hassles and Distress Tolerance in Predicting Cigarette Craving During a Quit Attempt

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ABSTRACT

Introduction: Ecological momentary assessment (EMA) has shown that smoking behavior is linked to transient variables in the smoker's immediate context. Such research suggests that daily hassles (e.g., losing one's keys) may be more likely to lead to cigarette craving and eventual lapse than infrequent, large-scale stressors (e.g., death of a loved one) among individuals attempting to quit smoking. However, individual differences in distress tolerance (DT) may moderate the relationship between daily hassles and daily cigarette craving during a quit attempt.

Methods: A sample of 56 veterans and community members drawn from a larger smoking-cessation study completed structured interviews and paper-and-pencil questionnaires during an initial laboratory visit and, directly following a quit attempt, were monitored via EMA. Multilevel modeling was used to examine the relationship between daily hassles and daily cigarette craving and to determine whether DT moderated this relationship.

Results: Daily hassles were positively associated with daily cigarette craving, and this association was moderated by individual differences in DT, such that the lower one's DT, the stronger the relationship between daily hassles and daily cigarette craving. This model explained 13% of the intraindividual variability and 8% of the interindividual variability in daily cigarette craving.

Conclusions: Smoking-cessation interventions may be strengthened by targeting smokers' individual responses to contextual factors, such as by helping smokers develop skills to cope more effectively with distress prior to and during the quit phase.

INTRODUCTION

Many individuals who attempt to quit smoking lapse within a few days (Shiffman et al, 1997). Thus, a better understanding of the factors associated with failed quit attempts is essential. Although much research has focused on contributors to lapses, an examination of factors associated with cigarette craving may prove more fruitful, as craving represents a more proximal point of intervention.

Ecological momentary assessment (EMA; Stone & Shiffman, 1994) has been used to demonstrate that cigarette craving and smoking are associated with transient contextual factors, such as negative affect and the social environment (e.g., Shiffman, 2005), that impact cigarette craving and lapses over minutes and hours rather than over days and weeks (Shiffman, 2005; Shiffman & Waters, 2004). This suggests that cigarette craving and eventual lapse may more often be precipitated by small-scale, everyday events rather than infrequent,

life-changing events during a quit attempt (Shiffman & Waters, 2004).

Smokers often claim that smoking decreases distress (Shiffman, 2005). However, the degree to which it does so likely varies by individual (Gilbert, 1995). For instance, individuals with low distress tolerance (DT)—that is, individuals whose goal pursuit is easily disrupted by physical or affective discomfort (Brown, Lejuez, Kahler, Strong, & Zvolensky, 2005)—find more reinforcement in smoking following a period of abstinence than individuals with relatively high DT (Perkins, Karelitz, Giedgowd, Conklin, & Sayette, 2010). Thus, low DT may exacerbate cigarette craving during a period of abstinence, particularly in the presence of other stressors or hassles.

The purpose of the present study was to test the relationship between self-reported daily hassles and cigarette craving along with its potential moderation by DT. Accordingly, two hypotheses were tested: (a) level of daily hassles is positively associated with mean daily cigarette craving and (b) baseline

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individual differences in DT moderates that association, such that individuals with high DT experience a weak relationship between daily hassles and cigarette craving. By contrast, individuals with low DT should experience a stronger, positive relationship between daily hassles and daily cigarette craving.

METHODS

Participants

Participants were 56 smokers (24 females; 18 Caucasians; mean age = 41.61 years, $SD = 9.61$) planning to quit without pharmacological assistance. Participants were recruited for a larger study on smoking cessation (Beckham, Calhoun, Dennis, Wilson, & Dedert, 2013), and met inclusion criteria if they reported smoking 10 or more cigarettes per day. For the present study, a subset of the larger sample with postquit EMA data and without any current *Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV)* Axis I disorders was used.

Procedure

At an initial screening session, participants completed the Fagerström Test of Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerström, 1991), a timed mirror-tracing persistence task measuring DT as the amount of time (in seconds) participants persisted with the task (see Brandon et al, 2003), the Structured Clinical Interview for *DSM-IV* Axis I disorders (First, Spitzer, Gibbon, & Williams, 1994), and a demographics questionnaire. Participants attended two smoking-cessation counseling sessions based on the American Cancer Society *FreshStart* program (Lando, McGovern, Barrios, & Etringer, 1990), after which a quit date was set.

EMA monitoring began on the quit date and continued for up to 14 days ($M = 8.60$ days; $SD = 2.15$), with data entered on PalmOne Treo 600 handheld computers. Participants completed entries in response to random alarms and were instructed to initiate entries whenever they smoked or craved a cigarette. At each reading, participants evaluated their present craving (“How strong is your urge for a cigarette right now?”) on a

scale of 1 (“Not at all”) to 5 (“Extremely”). Daily craving was tabulated as the mean of each participant’s craving ratings for a given day. Prior to turning off the computers each night, participants completed the Hassles and Uplifts Scale (Lazarus & Folkman, 1989), evaluating the degree to which 53 items presented a hassle that day on a scale of 0 (“None or not applicable”) to 3 (“A great deal”). A composite hassles score was generated as the mean of these items.

RESULTS

Dataset Preparation

During the postquit period, participants completed a mean of 73.18 readings ($SD = 31.44$), or a mean of 12.23 entries per day ($SD = 4.37$). Five participants (9%) lapsed (i.e., smoked) within the first day. Sixteen participants (29%) did not lapse within the observed period. Amongst the 40 participants who lapsed, mean time to lapse was 6.54 days ($SD = 8.31$).

Across the sample, mean daily cigarette craving was 2.06 ($SD = 0.87$), and mean daily hassles was 1.17 ($SD = 0.21$). Mean DT (time engaged in the mirror-tracing task), was 173.66 s ($SD = 85.57$), and mean FTND was 5.23 ($SD = 2.06$). Daily hassles and DT were z -transformed to facilitate interpretation of the below models.

Daily Cigarette Craving

Multilevel modeling was used to model day-to-day variations in cigarette craving. Daily craving was examined as a function of daily hassles and DT, controlling for age, gender, minority status, and FTND. Because daily craving likely varied from pre- to postlapse, this was also entered as a covariate.

Initially, a model without predictors was run to determine the proportion of variance in daily craving levels attributable to intraindividual variability and interindividual differences. According to the residual variances, 49% of the variance in daily craving level was associated with intraindividual variability, 51% with interindividual differences (both p values < .001; see Table 1, Model 1). A second model was run to determine the main effects of DT and daily hassles (see Table 1, Model

Table 1. Multilevel Models of Daily Craving Following a Quit Attempt

Parameter	Model 1	Model 2	Model 3
Coefficients			
Intercept	2.10*** (0.09)	2.13*** (0.44)	2.12*** (0.43)
Age		-0.01 (0.01)	-0.01 (0.01)
Gender (Male)		0.46** (0.19)	0.49*** (0.18)
Minority status		0.02 (0.20)	0.03 (0.19)
FTND		0.08* (0.05)	0.07 (0.05)
Postlapse		-0.26*** (0.09)	-0.25*** (0.09)
Distress tolerance		0.11 (0.09)	0.10 (0.09)
Hassles		0.15*** (0.05)	0.22*** (0.05)
Distress tolerance x hassles			-0.13*** (0.05)
Residual variances			
Interindividual differences	0.39*** (0.09)	0.33*** (0.08)	0.31*** (0.08)
Intraindividual variability	0.37*** (0.03)	0.35*** (0.03)	0.34*** (0.03)

Note. Coefficients and standard errors (in parentheses).

FTND = Fagerström Test of Nicotine Dependence.

* $p < .10$, ** $p < .05$, *** $p < .01$.

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2). According to this, males reported higher levels of daily craving than females, and, after lapsing, individuals reported lower daily craving. As predicted, daily hassles was positively related with daily craving. This model explained 9% of the intraindividual variability in daily craving levels and 6% of the interindividual differences, using Snijders and Bosker's (1999) pseudo- R^2 calculation.

According to a third model, which included the interaction between DT and daily hassles, the main effects for gender, postlapse period, and daily hassles were similar to those seen in the main-effects model (see Table 1, Model 3). Moreover, the daily-hassles effect was moderated by individual differences in DT. Plotting the simple slopes of daily hassles revealed that, the lower an individual's DT, the greater the relationship between daily hassles and daily cigarette craving (see Figure 1). This model explained 13% of the intraindividual variability in daily craving and 8% of the interindividual differences.

DISCUSSION

Results of the present study showed that as individuals experienced more daily hassles, they reported greater cigarette craving. Additionally, the relationship between daily hassles and cigarette craving was stronger for individuals low in DT. These results suggest that, in addition to traditional pharmacological nicotine replacement, individuals may benefit from smoking-cessation interventions that help them better cope with distress in order to maintain abstinence in the presence of distress triggered by everyday hassles (Brown et al, 2013).

An unexpected finding was that the primary contrast between high- and low- DT occurred when daily hassles were relatively low. This contrast should likely be interpreted with caution, primarily due to the modeled nature of the data. The contrast (when daily hassles were low) that was significantly different for DT was driven by a likely spurious positive main effect of DT (even though the main effect was nonsignificant). Replication with a larger sample of this unexpected finding could potentially clarify this finding.

Aside from the relatively small sample size, there were other limitations in the current study. Only a summary score of daily hassles was available. If hassles were measured at each reading a more fine-grained analysis could be conducted.

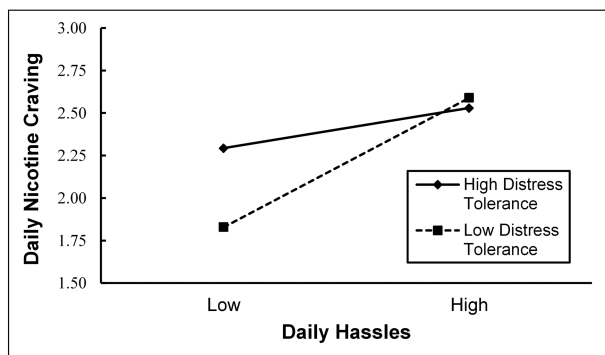


Figure 1. Modeled values of daily cigarette craving as a function of daily hassles and distress tolerance. Low and high levels of distress tolerance and daily hassles were estimated using 1-standard deviation offsets from the sample mean.

Because cigarette cravings were also evaluated as a daily summary score, it would also likely be more meaningful in future studies to have individuals rate both their craving and hassles at each reading.

Despite limitations, this study appears to be the first to demonstrate an association between daily hassles and cigarette craving and to identify a moderating role of DT in this association. Further, this study utilized EMA, which allowed for nonretrospective evaluation of cigarette craving. It will be important in future studies to further evaluate relationships among these variables as they relate to smoking abstinence.

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DECLARATION OF INTERESTS

None declared. The views expressed in this manuscript are those of the authors and do not necessarily represent the views of the Department of Veterans Affairs or the National Institutes of Health.

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