Reflexive Reaction to Feelings Predicts Failed Smoking Cessation Better Than Does Lack of General Self-Control

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Objective: Many treatment-seeking smokers have difficulty quitting and maintaining abstinence. Trait impulsivity versus self-control is relevant to this problem. However, impulsivity is a multi-faceted construct, and different measures emphasize different parts of it. This study compared 2 self-report measures of self-control versus impulsiveness as predictors of smoking cessation. One measure taps a very specific tendency to respond impulsively when experiencing emotions. The other taps overall self-control without reference to emotional states. Method: Adult smokers (N = 116) recruited from the community participated in a group-based smoking cessation intervention. The sample was racially/ethnically diverse, mostly male, middle aged, single, low income, and moderately nicotine dependent. Self-reports on scales titled Reflexive reaction to feelings and Self-control were completed at entry. Seven-day point prevalence abstinence (ppa) was assessed at end-of-therapy (EOT) and at 3- and 6-month follow-ups. A generalized estimating equation (GEE) tested overall relationships of the self-report scales with 7-day ppa across the assessments. Results: Bivariate analyses revealed inverse associations between Reflexive reaction to feelings and 7-day ppa; a positive association emerged between Self-control and 7-day ppa only at EOT. A GEE found that elevated scores on Reflexive reaction to feelings predicted failure in smoking cessation across the study period (adjusted odds ratio [AOR] = 0.69 [0.49–0.96], p = .03) and that Self-control scores did not do so significantly (AOR = 1.26 [0.80–1.99], p = .32). Conclusions: Results add to a literature suggesting the importance of emotion-related impulsivity to behavioral problems by showing its relevance to smoking cessation in treatment-seekers.

What is the public health significance of this article?
This study indicates that a specific facet of impulsivity—impulsive reaction to emotions—was a more robust predictor of failure in smoking cessation than was a measure of trait self-control that does not refer to emotions as a precipitator of impulses. The finding joins a growing literature pointing to emotion-related impulsivity as a contributor to a range of psychological problems, including tobacco dependence.

Keywords: impulsivity, emotion-related impulsivity, smoking cessation, self-control

Smoking cessation is an arduous process for most dependent smokers. Rates of cessation after behavioral and pharmacological treatments are relatively low, and relapse rates are high (Fiore et al., 2008; Schnoll & Lerman, 2006). Additional research on individual-difference factors may help to understand, and potentially increase, success during and after interventions.

Impulsivity as a Risk Factor
A construct that seems relevant to this issue is self-control versus impulsivity. Impulsivity is generally conceptualized in terms of taking actions without full consideration of their long-term consequences or of their ramifications for other desired ends.

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Charles S. Carver and Monica Webb Hooper designed the study and prepared the drafts of the paper. Monica Webb Hooper conducted data analyses. Charles S. Carver and Monica Webb Hooper had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Both authors reviewed and approved the final version of the manuscript.

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Self-control is generally seen as involving the overriding of such action tendencies. These properties are also incorporated into several broader personality constructs, including conscientiousness (which incorporates high self-control) from the Five-Factor Model of personality structure (e.g., Costa & McCrae, 1985) and psychoticism (which incorporates high impulsivity) from Eysenck’s (1975) Three-Factor Model of personality structure.

Impulsivity has received increasing interest in recent years as a potential risk factor for diverse behavioral problems (Carver, Johnson, & Joormann, 2008; de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012; Wright, Lipszyc, Dupuis, Thayaparanrajah, & Schachar, 2014). Along with this interest has come an increased awareness that impulsivity itself is a very broad construct. It has diverse antecedents and it is displayed in diverse ways (Berg, Latzman, Bliwise, & Lilienfeld, 2015; Carver, Johnson, Joormann, Kim, & Nam, 2011; Sharma, Markon, & Clark, 2014; Whiteside & Lynam, 2001). This diversity raises questions about whether all aspects of impulsivity versus self-control are equivalently important as potential contributors to behavioral problems.

In work bearing on this issue, Carver and colleagues (2011) extracted three factors from a set of self-report scales related to impulsivity versus self-control. Of most interest at present are two of those factors. One of them had loadings from scales that refer explicitly to emotions as triggers and impulsive actions as consequences. Another factor had loadings from scales that refer to overt behavior but do not refer to emotions as triggers.

Subsequent studies examined associations of these factors with indicators of psychological problems. These studies uniformly found that the emotion-triggered impulsive action factor was associated with problem tendencies. This aspect of impulsivity has been linked to internalizing problems such as depression (Carver, Johnson, & Joormann, 2013; Smith, Guller, & Zapoliski, 2013) and anxiety symptoms (Johnson, Carver, & Joormann, 2013a) and externalizing problems such as anger and aggression (Johnson et al., 2013a; Johnson & Carver, 2016), hypomania and mania (Giovanelli, Hoerger, Johnson, & Gruber, 2013; Muhtadie, Johnson, Carver, Gotlib, & Ketter, 2014; Johnson, Carver, Mulé, & Joormann, 2013b), and borderline personality disorder (Fulford, Eisner, & Johnson, 2015). In contrast, the factor that did not refer to emotions as triggers was less robustly related to these problems. Evidence from the literature on addictions also suggests that emotion-related impulsivity plays a more central role in these phenomena than do other aspects of impulsivity (Dick et al., 2010). Thus, evidence is beginning to mount that an impulsive reactivity to emotion (independent of the emotion’s valence) may contribute to diverse problems (see also Cyders & Smith, 2008).

Impulsivity and Smoking

What is known about impulsivity and smoking? A recent review found constructs that incorporate impulsivity to be related to all stages of smoking, including cessation and relapse (Bloom, Matsko, & Cimino, 2014). For example, Hooten et al. (2005) found that higher levels of conscientiousness predicted successful abstinence after treatment. Cosci et al. (2009) found that higher levels of psychoticism predicted failure at smoking cessation. Doran, Spring, McChargue, Pergadia, and Richmond (2004) found that elevated scores on the Barratt Impulsiveness Scale predicted smoking relapse. There is also evidence that trait impulsivity may precede smoking initiation and that chronic nicotine exposure may increase impulsive tendencies (Bloom et al., 2014).

These studies of impulsivity and smoking used measures of impulsivity (and related constructs) that are relatively general in form (Cosci et al., 2009; Doran et al., 2004; Hooten et al., 2005). In particular, those measures do not address emotion as a precipitator. On the other hand, another longstanding literature shows that smoking initiation and maintenance, failed cessation attempts, and difficulty in long-term abstinence all relate to problems with affect regulation (Carmody, 1992; Baker, Piper, McCarthy, Majeskie, & Fiore, 2004). If problems with affect regulation relate to smoking outcomes, emotion-triggered impulsiveness should be particularly relevant (as an aspect of impulsiveness) in the smoking context.

Present Research

The study reported here addressed this question by testing a self-report measure assessing emotion-triggered impulsiveness. As a point of comparison, it also included a measure of self-control that does not refer to emotional states as a precipitator but which has nonetheless successfully predicted a range of problem behaviors (de Ridder et al., 2012). These measures were tested as predictors of smoking cessation over a 6-month follow-up among smokers who participated in a one-arm group cognitive–behavioral therapy (CBT) plus transdermal nicotine patch (TPN) intervention. The primary outcome was the overall (i.e., longitudinal) treatment effect on 7-day point prevalence abstinence (ppa). Given the existing literature on smoking cessation, we hypothesized that self-control would be positively related to success in cessation and that reflexive reaction to feelings would be inversely related to success. Given the developing literature on facets of impulsivity, we also hypothesized that the measure of impulsive reaction to feelings would be a more robust predictor than the measure of self-control that does not refer to emotions as a precipitator.

Method

Participants

Adult smokers were recruited from South Florida via community advertisements and outreach to participate in a study examining the effects of group CBT on smoking cessation. Inclusion criteria were current smokers (≥5 cigarettes per day and/or have a breath carbon monoxide [CO] reading of ≥8 ppm), adults (>18 years of age), able to speak and read English, able to attend clinic sessions, and interested in quitting smoking. Participants who were enrolled in another cessation program, reported contraindications for patch use, were pregnant or planning to become pregnant, were breastfeeding, endorsed active addiction to another substance (e.g., illicit drugs or alcohol), or were identified as having a severe mental illness were excluded.

Participants enrolled in the larger smoking cessation study (see Webb Hooper & Kolar, 2015) between December 2012 and April 2013 were offered the opportunity to participate in a substudy examining the relationship between personality characteristics and smoking cessation. Data were drawn from participants who consented to participate (n = 134), completed the baseline assessment,
and completed at least one of the three outcome assessments (end of therapy [EOT], and 3- and 6-month follow-ups; \( n = 116, 87\% \)).

**Procedures**

This study was approved by the University Institutional Review Board. Eligible participants were scheduled to attend orientation; attendees provided written informed consent and completed the baseline measures for the substudy. Participants subsequently completed the eight-session CBT, followed by EOT measures at Session 8 and follow-ups at 3 (in person) and 6 months (via telephone) post-EOT. Participants were paid up to $110 for assessment completion.

**Intervention**

Among the best approaches for smoking cessation is CBT with adjuvant pharmacotherapy (Fiore et al., 2008; Lemmens, Oenema, Knut, & Brug, 2008; Moore et al., 2009; Mottillo et al., 2009; Webb, 2008). CBT for smoking cessation includes coping skills training, cognitive reframing, minimizing the emotional and behavioral impact of abstinence violation, behavioral contracting, and relapse prevention strategies (Brandon, Copeland, & Saper, 1995; Brandon, Zelman, & Baker, 1987; Zelman, Brandon, Jorenby, & Baker, 1992). The CBT used in the study reported here was delivered in a group format and was supplemented with nicotine replacement therapy.

A key aspect of the intervention was providing tools to manage the emotional aspects of smoking cessation attempts. As noted earlier, both positive and negative emotions have been related to smoking relapse; thus, the management of these emotions is emphasized in treatment. Smokers are taught to identify emotional states that are tied to smoking, such as frustration, depression, or anger. These high-risk emotional states are carefully monitored throughout the intervention, and participants are taught how to manage them without smoking. Such tools are useful, but they are more useful for some people than others.

The CBT consisted of eight group sessions conducted over 4 consecutive weeks (Webb, de Ybarra, Baker, Reis, & Carey, 2010). The behavioral intervention was supplemented by 8 weeks of TNP therapy (4 weeks at 21 mg, 2 weeks at 14 mg, and 2 weeks at 7 mg). Per manufacturer recommendations, TNP dosages were adjusted according to cigarettes smoked per day. The CBT was an enhancement of an established intervention (Brandon et al., 1987; Brandon et al., 1995; Zelman et al., 1992). The target quit day was Session 1, and the intervention was front-loaded, such that Sessions 1–4 occurred during Week 1, Sessions 5–6 during Week 2, Session 7 during Week 3, and Session 8 occurred during Week 4. Groups averaged eight participants per cohort. Sessions were 90–120 min and led by cotherapy pairs (trained bachelor’s and master’s level interventionists) who were closely supervised by the principal investigator. Intervention fidelity was monitored by review of audio/videotapes and weekly supervision.

The group CBT consisted of two primary components: group therapy and social support. Group therapy included psychoeducation on the health effects of smoking, the benefits of cessation, nicotine dependence, and managing withdrawal symptoms such as negative affect and urges to smoke. Cognitive restructuring and lifestyle modification were key CBT techniques. Sessions also emphasized the identification of risky situations (emotional and behavioral) and utilizing coping skills training during urges to smoke. The group format was also designed to provide social support from peers and interventionists during the initial weeks postcessation, when the need to exert self-control and manage nicotine withdrawal is the greatest.

**Measures**

We focus here on two self-report measures that the participants completed at study entry. One is a measure of the specific tendency to respond reflexively to the experience of emotion; the other is a broader measure of self-control that does not refer to emotions. Previous research has determined that these measures assess distinguishable aspects of impulsive versus self-control, as reflected by factor analysis (Carver et al., 2011).

**Reflexive reaction to feelings.** Reflexive reaction to feelings is a seven-item scale developed by Carver et al. (2011) for their study of diverse aspects of impulsivity. As noted earlier, that study included a factor analysis of multiple measures, yielding three factors. Reflexive reactions to feelings was the scale that loaded most strongly on the factor reflecting emotion-triggered impulsive action. Its items are statements indicating impulsive behavioral reactions to emotions (e.g., “I generally act on my feelings instantly” and “When I feel a desire, I act on it immediately”). None of the items of this scale refers specifically to negative feelings, although some do refer to positive feelings. Responses, on a 1–5 scale ranging from complete disagreement to complete agreement, were averaged (\( \alpha = .91 \)).

**Self-control.** The Self-Control scale (Tangney, Baumeister, & Boone, 2004) is a measure of overall self-control tendencies, but one that does not refer to emotions as a trigger. We used the 13-item Brief Self-Control scale (also reported in Tangney et al., 2004), which correlates strongly with the longer version. Self-control has been found to predict grade point average, adjustment, alcohol abuse, interpersonal skills, and several other behaviors (de Riddler et al., 2012; Tangney et al., 2004). The content of items on the Self-Control scale tends to reflect remaining focused on completing activities (e.g., “I am able to work effectively toward long-term goals”) and the tendency to be self-controlled versus giving in to impulses (e.g., “I wish I had more discipline” [reversal]). This measure was the second highest loading scale on the factor in the Carver et al. (2011) factor analysis that did not refer to emotions as a trigger. Responses were made on a 1–5 scale ranging from complete disagreement to complete agreement and (after item reversals, as needed) responses were averaged (\( \alpha = .76 \)).

**Smoking status.** Smoking status at the EOT and at 3- and 6-month follow-ups was measured using the established timeline follow-back (TLFB) procedure (Brown et al., 1998). The outcome was 7-day ppa (i.e., not even a puff of a cigarette over the preceding 7 days), examined longitudinally. Smoking status was CO-verified at the EOT and at the 3-month follow-up (Hughes et al., 2003; SRNT Subcommittee on Biochemical Verification.1

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1 There were no significant differences in baseline characteristics or assessment completion rates between participants in the larger study and those in the substudy.
Demographics, smoking history, and process variables. In addition to the primary measures just described, participants reported age, sex, racial/ethnic group, household income, marital status, and education. We also assessed cigarette smoking rate (number of cigarettes smoked per day [CPD]), duration (years smoking), and nicotine dependence using the Fagerström Test for Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerström, 1991). At each CBT session, attendance was recorded. We also assessed TNP adherence since the previous session and verified that participants were wearing their patches.

Statistical Analyses
To test for selection bias, we compared the baseline characteristics and completion rates of participants in the larger study to those in the substudy using t tests and χ² tests. We then conducted descriptive statistics (means, SDs, and percentages) for the sub-study sample and computation of bivariate relationships among demographics, smoking history, process measures, and psychological traits (using Pearson’s correlations for continuous measures and point biserial correlation coefficients for associations between categorical and continuous variables). We computed smoking cessation rates for each assessment point (7-day ppa at the EOT and 3- and 6-month follow-ups). Per recommendations, we compared findings using an intent-to-treat approach, in which missing data were coded as smokers, and using complete case analyses (Hughes et al., 2003). Because there were minimal missing data (see Results) and the results were the same, the complete case analyses are presented here.

Given our primary interest in estimating overall associations, we used a generalized estimating equation (GEE) specifying the logit function to test self-control, reflexive reaction to feelings, and their interactions with time (EOT and 3- and 6-month follow-ups) as independent predictors of overall cessation (using SPSS version 22). GEE is a more powerful extension of logistic regression because it incorporates all assessment points in a single model, estimates relationships across correlated repeated measures and non-normal distributions, and uses all available pairs in estimating the working correlation parameters rather than deleting cases with any missing observations.

Multivariate logistic regression analyses tested self-control and reflexive reaction to emotions as independent predictors of smoking status, modeling the odds of cessation/success. The multivariate model also included the interaction of each predictor with time (EOT and 3- and 6-month follow-ups). Tolerance statistics for each predictor found no evidence of multicollinearity. Alpha was set at p < .05 (two-tailed).

Results
Eighty-seven percent of participants completed the CBT intervention (i.e., attended orientation and at least 50% of sessions). Study retention was high: 112 (96%) completed the EOT assessment, 113 (97%) completed the 3-month follow-up, and 108 (93%) completed the 6-month follow-up. There were no differences in the demographics, smoking history, or trait variables between completers and noncompleters (all ps > .05). Table 1 displays the characteristics of the overall sample. The sample was mostly male, middle aged, single, had completed high school or less, and were low income. Most identified with one or more racial/ethnic minority groups.

The bivariate correlations of demographic, smoking history, intra-CBT, and smoking status with psychological traits are also shown in Table 1. Session attendance was positively related to Reflexive reaction to feelings (p < .05). The two main predictors—Self-control and Reflexive reaction to feelings—were moderately correlated. Reflexive reaction to feelings was inversely associated with smoking at each follow-up such that those with higher scale scores (i.e., more reflexive reaction) were less likely to have quit smoking for the previous 7 days at any time point. A significant association was observed for self-control at the EOT, such that greater self-control was positively related to 7-day ppa, but associations between smoking cessation and self-control were not significant at either follow-up.

Multivariate Prediction of Smoking Cessation
The prevalence of smoking cessation was 55% at the EOT, 45% at the 3-month follow-up, and 47% at the 6-month follow-up. A GEE evaluated Reflexive reaction to feelings and Self-control as simultaneous predictors of 7-day ppa including all three time points. Reflexive reaction to feelings, Self-control, and the interaction of each with repeated measurement were entered simultaneously into the model to predict abstinence. This analysis yielded an overall inverse association between Reflexive reactions to feelings and 7-day ppa (adjusted odds ratio [AOR] = 0.69 [0.49–0.96], p = .03), such that higher Reflexive reaction to feelings scores predicted lower odds of 7-day ppa. The relationship between Self-control and 7-day ppa was not statistically significant (AOR = 1.26 [0.80–1.99], p = .32). The interaction between time and Reflexive reaction and that between time and Self-control were not significant (ps > .05).

Discussion
The goal of this study was to examine a self-report measure of impulsive reactions to feelings and a measure of self-control that does not refer to emotions as prospective predictors of smoking cessation. This is the first study to test these associations in a racially/ethnically diverse sample or in a sample of smokers. As hypothesized, greater reports of impulsive reactions to feelings predicted lower likelihood of smoking cessation over time. Thus, when controlling for a measure of self-control that does not refer to emotions as a precipitator, reports of impulsive responding to feelings as a specific facet of impulsivity influenced responses to an established smoking cessation intervention. In contrast to this, the odds of smoking cessation were not significantly related in the GEE analysis to self-reports on the Self-control scale, although that scale was significantly related to successful cessation at EOT in a bivariate test.

These findings conceptually replicate, but extend in an important way, results of several previous studies. Doran et al. (2004)
found that impulsiveness predicted smoking relapse using the Barratt Impulsiveness Scale as the index of impulsiveness. That measure differentiates modes in which impulsiveness is expressed, but its items do not address the nature of the trigger of the impulsive response. Hooten et al. (2005) found that abstinence after treatment was associated with higher levels of conscientiousness. Conscientiousness incorporates aspects of self-control versus impulsivity, but it is not specific to emotion-related impulsivity. Cosci et al. (2009) found that higher levels of psychoticism predicted lower success at smoking cessation. Again, this construct incorporates elements of self-control versus impulsivity, but again it is not specific to emotion-related impulsivity.

In contrast to these studies, the present study found that a measure that focuses on reacting impulsively to emotions did a better job in predicting smoking cessation than did a measure of self-control that does not refer to emotions. This finding joins a developing literature suggesting the involvement of this aspect of impulsivity in various internalizing and externalizing problems (Carver et al., 2013; Fulford et al., 2015; Giovanelli et al., 2013; Johnson et al., 2013a; Johnson et al., 2013b; Johnson & Carver, 2016; Muhtadie et al., 2014; Smith et al., 2013). The literature as a whole suggests the importance of impulsive responses to emotions as a contributor to symptoms of psychological disorders. We now find the same is true with regard to success in treating tobacco dependence.

We note that the measure of emotion-triggered impulsiveness used here does not refer specifically to negative emotions. It is of some interest in that regard that, although the literature of smoking and affect regulation pertains mostly to negative affect (Brandon, 1994; Carey, Kalra, Carey, Halperin, & Richards, 1993; Shiffman, 1993; Wills & Hirsy, 1996), there is also evidence that positive emotional states are associated with nicotine dependence (Winkler et al., 2011) and can interfere with smoking cessation (Brandon, Zelman, & Baker, 1990). Doran et al. (2006) found that positive affect before starting CBT for smoking cessation predicted less subsequent abstinence. The accumulating evidence suggests that the extent of the person’s reactivity to emotion may be more important in this context than is the emotion’s valence.

The other measure of self-control included here was successful in predicting smoking cessation by bivariate correlation at the

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**Table 1**

**Sample Characteristics and Bivariate Correlations With Trait Measures**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>M</th>
<th>SD</th>
<th>Possible range</th>
<th>Observed range</th>
<th>Correlation with self-control</th>
<th>Correlation with reflexive reaction to feelings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>48.3</td>
<td>9.9</td>
<td>18–</td>
<td>18–75</td>
<td>.03</td>
<td>-.03</td>
</tr>
<tr>
<td>Smoking rate (CPD)</td>
<td>19.7</td>
<td>10.3</td>
<td>1</td>
<td>5–60</td>
<td>-.02</td>
<td>-.06</td>
</tr>
<tr>
<td>Smoking duration (years smoked)</td>
<td>27.1</td>
<td>11.9</td>
<td>0</td>
<td>2–60</td>
<td>.05</td>
<td>.02</td>
</tr>
<tr>
<td>Nicotine dependence (FTND)</td>
<td>5.8</td>
<td>2.1</td>
<td>0–10</td>
<td>1–10</td>
<td>-.16</td>
<td>.13</td>
</tr>
<tr>
<td>Session attendance</td>
<td>7.0</td>
<td>1.32</td>
<td>0–8</td>
<td>1–8</td>
<td>-.06</td>
<td>.17</td>
</tr>
<tr>
<td>Nicotine patch use</td>
<td>6.3</td>
<td>1.9</td>
<td>0–8</td>
<td>1–8</td>
<td>-.06</td>
<td>-.15</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

*Sex*a

| Female                  | 51   | 44   | .06                  | -.02                                           |
| Male                    | 65   | 56   |                       |                                               |

*Marital status*b

| Single          | 66   | 57   | .00                  | -.07                                           |
| Currently/ever-married | 49   | 43   |                       |                                               |

*Education*c

| High school or less | 64   | 56   | -.02                | -.07                                           |
| Greater than high school | 50   | 44   |                       |                                               |

*Annual household income*b

| <$10,000       | 60   | 54   | -.01                | .05                                            |
| $10,000/year  | 52   | 46   |                       |                                               |

*Race/ethnicity*b

| Black/African American | 52   | 45   | .09                  | .13                                            |
| White                 | 25   | 22   |                       |                                               |
| Native American       | 3    | 2    |                       |                                               |
| Hispanic (any race)   | 32   | 28   |                       |                                               |
| Other                 | 4    | 3    |                       |                                               |

*Psychological traits*

| Self-control         | 3.24 | .68  | 1–5                 | 1.5–5.0                                      | -.30**                                        |
| Reflexive reaction to feelings | 3.1  | 1.1  | 1–5                 | 1–5                                         | -.30**                                        |

*Smoking status*

| 7-day ppa (EOT)      | 112  | 55   | .19                  | -.30**                                        |
| 7-day ppa (3 months) | 113  | 45   | .14                  | -.22**                                        |
| 7-day ppa (6 months) | 108  | 47   | .18                  | -.21**                                        |

*Note.* CPD = number of cigarettes smoked per day; FTND = Fagerström Test for Nicotine Dependence; EOT = end of treatment.

a Point biserial correlation. b Point biserial correlation with Black/African American vs. all other racial/ethnic categories.

cp < .05. **p < .001.
EOT. The bivariate association may be regarded as a partial replication of previous findings pertaining to impulsivity and relapse. However, in the GEE analysis, this measure of self-control had to compete with a measure that focused on emotion-related impulsivity, with which it was moderately correlated. When the two were considered jointly, only the latter made a significant unique contribution.

This study has important limitations. The sample consisted of treatment-seeking smokers who were willing to participate in an intensive intervention. Thus, findings may not generalize to smokers who would not enroll in such studies, those in other geographic locations, or to therapy approaches other than CBT. The sample overall had a relatively high abstinence rate, and it is also unclear whether the findings would generalize to samples with lower success rates. However, the abstinence rate observed in the present study is consistent with those from previous research (e.g., Hall et al., 2011). In addition, we assessed only two aspects of impulsivity here; it may be that other aspects of this trait that are also important were disregarded. Furthermore, the precise mechanism underlying the effect of emotion-related impulsivity is unknown because the data do not allow us to determine what emotional stimuli were most salient or important to participants during the period under study (e.g., discomfort of withdrawal, aspects of craving, situations unrelated to smoking per se that were charged with negative or positive emotions). Finally, smoking status at the 6-month time point was based on self-report, although a modified bogus pipeline technique was used to encourage accurate reporting (Robinson et al., 2003).

Despite these limitations, the findings suggest that reflexive reaction to feelings should be considered a potentially important risk factor for failure in smoking cessation in the context of treatment. An important clinical issue is the extent to which the trait under study here can be modified by treatment. Because there was no follow-up assessment of impulsiveness, we do not know whether this intervention affected it. Another important clinical issue is whether this trait can be modified by treatment. Because there was no follow-up assessment of impulsiveness, we do not know whether this intervention affected it. Another important clinical issue is whether this trait is similarly problematic in other therapeutic contexts, either other smoking treatments or treatments for other kinds of problems. Additional research on these issues is warranted.

References


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