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Depression, Neuroticism, and Mood-Regulation Expectancies for Engagement and Disengagement Coping Among Cigarette Smokers

Dara G. Friedman-Wheeler^{1,2}, David A. F. Haaga^{1,3}, Kathleen C. Gunthert¹, Anthony H. Ahrens¹, and Elizabeth McIntosh^{1,2}

¹ Department of Psychology, American University, Washington, DC

² Dara Friedman-Wheeler is now at the Psychopathology Research Unit, Department of Psychiatry, University of Pennsylvania. Elizabeth McIntosh is now at the Department of Psychological Health and Psychiatry, Wardenburg Health Sciences Center, University of Colorado at Boulder

Although findings have not been completely consistent (e.g., Catley, Ahluwalia, Resnicow, & Nazir, 2003), a number of studies have shown that high levels of depressive symptoms predict difficulty in quitting smoking and maintaining abstinence (e.g., Kinnunen, Doherty, Militello, & Garvey, 1996; Niaura et al., 2001). The reasons for an association between depressive symptoms and difficulty quitting smoking are not certain. Depression may be associated with severe withdrawal symptoms (Wilhelm, Arnold, Niven, & Richmond, 2004). It may also influence responses to stressful events after quitting smoking. Quitting smoking may effectively eliminate a strategy used to cope with depressed mood (Haaga, Thorndike, Friedman-Wheeler, Pearlman, & Wernicke, 2004), and coping behaviors have been found to partially mediate the relationship between history of major depression and depressive symptoms during an attempt to quit smoking (Kahler, Brown, Strong, Lloyd-Richardson, & Niaura, 2003).

Depressed people tend to report fewer coping resources than their nondepressed counterparts (Kinnunen et al., 1996). Current depressed mood is associated with reliance on specific types of coping behavior, including behavioral disengagement, denial, and focus on and venting of emotion (Watson, David, & Suls, 1999). To the extent that these tactics are ineffective for long-term mood regulation (Larsen, 2000), it follows that depressed persons would have difficulty giving up even an unhealthy coping behavior, such as cigarette smoking, if they perceive it to be helpful in alleviating stress and negative mood (Kassel, Stroud, & Paronis, 2003).

Accordingly, the first question addressed in our research was whether, in a sample of regular cigarette smokers, those with more depressive symptoms would be more likely to endorse the use of disengagement coping strategies, a pattern which could partially explain their difficulty in quitting smoking.

In addition to determining whether depressive symptoms are associated with disengagement coping strategies, we studied a possible mechanism that could account for such a relation. In particular, it could be that depression is associated with favorable outcome expectancies for

³All correspondence should be addressed to David A. F. Haaga, Department of Psychology, Asbury Building, American University, Washington, DC 20016-8062. Electronic mail may be sent to dhaaga@american.edu.

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disengagement coping strategies. Outcome expectancies are people's estimates of the probability that a given response will precipitate particular outcomes (Bandura, 1977). Strong expectancies for a desirable outcome increase the likelihood that a behavior will be performed. We were interested specifically in outcome expectancies for mood regulation. Certain behaviors, such as eating, may occur more in response to negative mood only when expected to improve negative affect (Tice & Bratslavsky, 2000). Our second research question dealt with extending this effect to the context of disengagement coping among depressed smokers. In particular, we studied whether smokers with more depressive symptoms would be more likely to expect disengagement coping strategies to improve their moods.

Alternatively, more depressed smokers might choose disengagement coping strategies not as a result of favorable mood-regulation expectancies but as a function of their relative ease of implementation. Given that depression is often associated with diminished motivation and loss of energy, more active responses, such as approaching the people involved in a stressful situation, may not seem feasible. More passive responses may seem more realistic, and may be chosen for that reason alone, regardless of expectations for the effectiveness of such a strategy for improving mood. In the terms of social cognitive theory (Bandura, 1977), self-efficacy for implementing active coping strategies may be too low to permit their use, even if mood-regulation outcome expectancies for them were favorable. If this analysis were correct, we should see less entrainment of mood-regulation expectancies and projected use of particular coping strategies among more depressed smokers than among less depressed smokers. Whether depression would moderate the outcome expectancy/use relation for coping strategies was therefore our third research question.

In sum, we examined whether, among cigarette smokers, those experiencing more depressive symptoms would (a) be especially likely to project using disengagement coping strategies; (b) hold more favorable outcome expectancies regarding disengagement coping strategies as a means of regulating mood; and/or (c) show weaker relations between projected use and outcome expectancies for coping strategies.

In exploring these questions, we evaluated neuroticism as well as depressive symptoms. Neuroticism is associated with increased use of certain coping strategies, such as catharsis and self-blame (Gunthert, Cohen, & Armeli, 1999). Neuroticism has been likened to the "general distress" component of the tripartite model (Clark & Watson, 1991) of anxiety and depression, whereas the depression-specific component is low positive affectivity. Depression and anxiety have been found to have unique effects on coping (Gunthert, Cohen, & Armeli, 2002). Thus, there may be both specific (to depression) and general (related to neuroticism) associations of negative affect with coping.

Method

Participants

Participants were 72 people (33 women, 39 men) recruited via newspaper advertisements for a study of personality and smoking. Inclusion criteria were being at least 18 years old and smoking daily. Of the 72 participants, two (3%) were Asian, 46 (64%) Black or African-American, 23 (32%) Caucasian, and one (1%) biracial. The average age was 45 (range: 22–68).

Measures

Fagerström Test for Nicotine Dependence (FTND)—The FTND (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991), a 6-item self-report scale, was used to characterize the severity of nicotine dependence among participants. FTND scores range from 0 to 10, with

higher scores reflecting more severe nicotine dependence. The FTND has demonstrated satisfactory internal consistency, retest reliability, and convergent validity with cotinine levels and self-reports of “addiction” as a reason to smoke (Heatherton et al., 1991; Pomerleau, Carton, Lutzke, Flessland, & Pomerleau, 1994).

Beck Depression Inventory-II (BDI-II)—The BDI-II is a 21-item measure of depressive symptom severity (Beck, Steer, & Brown, 1996). The items in the BDI-II reflect the diagnostic criteria for Major Depressive Disorder (Steer, Ball, Ranieri, & Beck, 1999), as defined by the DSM-IV (American Psychiatric Association, 1994).

NEO Five Factor Inventory (NEO-FFI); Neuroticism Scale—The neuroticism scale of the NEO-FFI (Costa & McCrae, 1992) includes 12 items that measure a predisposition to negative affect (McCrae, 1990). Items are rated on a 5-point scale from “strongly disagree” to “strongly agree”.

Stress and Coping Process Questionnaire (SCPQ)—Coping was measured with a modified and condensed version of the SCPQ (Reicherts & Perrez, 1991). The SCPQ is a vignette measure designed to assess the way people respond to specific stressful situations in daily life (Reicherts, 1992). It consists of eighteen standardized stressful episodes which vary with respect to controllability, changeability, valence (severity), ambiguity, and domain or theme. Each scenario describes either a “loss and failure” situation (e.g. a friend moves away) or an “aversive stimulation” situation (e.g., boss assigns difficult and time-consuming task). Participants imagine themselves experiencing each situation and then indicate what strategies they might use in responding to the situation (projected use). Sample strategies include “fade out, stop paying attention or look for distractions” and “make clear to myself what is at stake and what I should do”. Participants rated the likelihood of using each strategy on a scale from 0 (not at all) to 4 (certainly).

The SCPQ was modified in several ways for use in this study. First, to reduce respondent burden, we selected just six of the original eighteen vignettes, based on (a) understandability in pilot-testing and (b) maintaining variability with respect to the dimensions relevant to the present study (social vs. professional domains, loss vs. aversive stimulation). Second, several of the coping-strategy items were modified slightly in order to improve comprehensibility as determined in pilot testing. Third, in order to test our hypotheses regarding expectancies for the effectiveness of coping tactics in regulating affect, we added to each vignette a question about how likely each of the given coping strategies would be to make the participant feel better in the given situation. These expectancies were rated on a scale from 0 (extremely unlikely to make me feel better) to 4 (extremely likely to make me feel better).

Scores were thus derived for each participant based on (a) projected use of each strategy, summed across vignettes and (b) mood-regulation expectancies for each strategy, summed across vignettes. Each participant thus initially had 22 scores: a “use likelihood” score for each of the 11 coping strategies, and an “expectancy” score for each strategy. To facilitate analysis of categories of coping rather than individual coping strategies, we conducted a factor analysis of SCPQ data (see Results section).

Procedure

Participants completed the measures listed above, as well as additional assessments not relevant to this report (diagnostic interview, computerized cognitive task, other questionnaires), individually. All measures were presented in randomized order.

Results

Descriptive data on depressive symptoms, neuroticism, and smoking appear in Table I. All tests were two-tailed.

Factor Analysis of SCPQ

Two subscales emerged through factor analysis of the “projected use” data of the SCPQ – participants’ ratings of which strategies they would likely use – totaled across the six vignettes. The two-factor solution was obtained using Principal Components Analysis with Oblimin rotation, as recommended by Field (2000) when factors are not necessarily believed to be orthogonal. Although three factors were originally kept based on the scree test, the third factor consisted of three items which did not cohere well conceptually, and two of which loaded more heavily on one of the other two factors; this third factor was therefore excluded. The two remaining factors accounted for 59.1% of the variance in SCPQ scores.

These two factors appeared to comprise “engagement” strategies (Cronbach’s $\alpha = .83$), which involve dealing directly with the situation and/or the thoughts and emotions elicited by the situation, and “disengagement” strategies ($\alpha = .85$), which consist of orienting oneself away from the stressor and associated thoughts and emotions (Connor-Smith & Compas, 2004). The factor loadings are given in Table II.

Negative Affect and Projected Use of Coping Strategies

Depressive symptoms and neuroticism were highly correlated ($r = .66, p < .01$). Correlations of each with projected use of coping strategies are in Table III. Depression was not related to the projected use of engagement strategies, whereas neuroticism was negatively associated with their projected use. Both depression and neuroticism were positively associated with projected use of disengagement strategies. With neuroticism statistically controlled, the partial correlations of depressive symptoms with engagement and disengagement strategies were nonsignificant. Controlling for depression, the partial correlation of neuroticism with projected use of engagement strategies was nonsignificant, but the positive association between neuroticism and projected use of disengagement strategies remained significant.

In sum, our first main research question, whether smokers with more depressive symptoms would be more likely to endorse the use of disengagement coping strategies, was answered in the affirmative, but the relation was actually more robust with neuroticism rather than depressive symptoms in particular.

Negative Affect and Mood-Regulation Expectancies for Coping Strategies

Depression was unrelated to mood-regulation expectancies for engagement strategies, while neuroticism correlated negatively with expectancies for engagement coping. Both depression and neuroticism also correlated positively with mood-regulation expectancies for disengagement strategies (see Table IV). When neuroticism was partialled out, the correlations between mood-regulation expectancies for coping strategies and depression were non-significant. When controlling for depression, the relationship between neuroticism and mood-regulation expectancies for engagement strategies was non-significant, whereas a significant relationship between neuroticism and mood-regulation expectancies for disengagement strategies remained (see Table IV).

In summary, the answer to our second research question, whether smokers with more depressive symptoms would be more likely to expect disengagement coping strategies to improve their moods, was yes, but again the more substantial association was with neuroticism as opposed to depressive symptoms.

Multilevel Models of Mood-Regulation Expectancies and Projected Use of Coping Strategies

Our third research question was whether more depressed smokers would show weaker relations between projected use and mood-regulation expectancies for coping strategies. In examining this issue we employed multilevel analyses. Specifically, using Hierarchical Linear Modeling (HLM, Bryk & Raudenbush, 1992), we conducted within-person analyses to examine relationships between individuals' mood-regulation expectancies for the different types of coping and their projected use of these types of strategies.

At level 1, the responses from the six vignettes were used to generate a unique within-subject regression equation for each person. The slope coefficient from this analysis indicates, for each person, the relationship between mood-regulation expectancies and projected use of a strategy, where a steeper within-person slope indicates a stronger association between one's expected effectiveness of a strategy and projected use of that strategy. At level 2, we estimated differences in these slopes as a function of depressive symptoms or neuroticism. It is important to note that these regression coefficients are unstandardized; their magnitude depends on the measurement scale of the variables involved.

On average, there was a strong positive within-person relationship between mood-regulation expectancies for engagement coping and projected use of engagement coping ($b_{10} = .473$, $p < .001$). Neither depression nor neuroticism moderated this relationship ($b_{11} = -.004$ and $b_{11} = -.004$, respectively, $p's > .05$). On average, there was a strong positive within-person relationship between mood-regulation expectancies for disengagement coping and projected use of disengagement coping ($b_{10} = .623$, $p < .001$). Once again, neither depression nor neuroticism moderated this relationship ($b_{11} = -.002$ and $b_{11} = -.010$, $p's > .05$).

In summary, the HLM analyses used to address our third research question revealed that projected use and mood-regulation expectancies for coping strategies were strongly related in our sample, but this relation was *not* moderated by depressive symptoms or neuroticism.

Discussion

Depression and neuroticism showed positive relationships with the projected use of disengagement coping strategies. These results are consistent with earlier research and extend those findings to the context of cigarette smoking. Neuroticism was also inversely related to the projected use of engagement coping. When depression and neuroticism were each considered with the other partialled out, several of these relationships remained significant. In examining these partial correlations, it is important to consider the conceptual relationships among the variables in question. Controlling for neuroticism when examining depression explores possible relationships between those aspects of depression which are specific to depression and not included in the construct of neuroticism. For example, while neuroticism and depression both imply higher levels of negative affect, the application of the tripartite model of anxiety and depression (Clark & Watson, 1991) would suggest that depression also implies a tendency to experience decreased positive affect. Relationships between depression and the coping subscales were non-significant when neuroticism was controlled, suggesting that depression may not be related to coping behavior beyond what variability may be accounted for by neuroticism. Thus, negative affectivity may be more important to coping choices than positive affectivity.

Similarly, to control for depression when examining neuroticism is to examine the relationship between coping and what is left of neuroticism when current depression is removed (e.g., anxiety, worry, anger). When examined this way, neuroticism was positively associated with the projected use of disengagement strategies. This association is consistent with previous

research, which has found a link between neuroticism and the tendency to use “escape-avoidance” coping strategies (O’Brien & DeLongis, 1996).

As with strategy use, depression and neuroticism showed significant positive relationships with mood-regulation expectancies for disengagement coping strategies and, in the case of neuroticism, an inverse relationship with mood-regulation expectancies for engagement coping strategies. The direct relationships with positive mood-regulation expectancies for disengagement coping may seem counterintuitive, given that depression tends to be associated with more negative views of the future, not with higher positive expectations. However, persons with a tendency to experience more intense/frequent negative affect may well be more motivated to believe that certain coping responses will be effective, given the aversiveness of negative affect, and this motivation may lead to higher positive expectancies for the strategies, as per the “wishful thinking” paradigm (cf. Brandtstädter, 2000).

People who are depressed may be so because of ineffective mood-regulation (Larsen, 2000). Perhaps the tendency for persons high in depression and/or neuroticism to hold higher positive mood-regulation expectancies for disengagement coping strategies represents a vulnerability to negative affect. In other words, perhaps disengagement strategies are not as effective at regulating mood as engagement strategies and are relied on too heavily for mood-regulation, because of overly-positive expectancies for their effectiveness.

Expectancies for each type of coping strategy (engagement and disengagement) and the projected use of those strategies were highly correlated, within participants. This pattern is consistent with expectancy theories, which suggest that holding high (positive) expectancies for a behavior will be associated with an increased likelihood of performing that behavior (Maddux, 1999). This relation between outcome expectancies and projected use was not moderated in the HLM analyses by individual differences in depressive symptoms or neuroticism. This nonsignificant result argues against the conjecture that more depressed smokers might use disengagement coping strategies because they are relatively easy to implement, even if expected to be less useful in regulating mood. Instead, the data suggest that coping strategy choice is linked to expected outcomes for more depressed smokers as well as for less depressed smokers.

Ineffective coping strategies have been associated with lapses after smoking cessation (Shiffman, Paty, Gnys, Kassel, & Hickcox, 1996), and depressed smokers have been found to report fewer coping resources than nondepressed smokers (Kinnunen et al., 1996). Understanding the role of coping expectancies and negative affect in coping behavior may thus be of particular importance to these individuals. In addition, the fact that depression is often associated with failure in smoking cessation suggests that there is something different about depressed-smokers – perhaps that difference is related to coping expectancies and/or behaviors. Research examining these variables in the context of smokers undergoing a quit attempt could explore this issue further.

The question of what defines “effective coping” is a complex one. For example, does “feeling better” mean feeling less negative affect immediately, or in the long term? It seems plausible that the disengagement strategies “preferred” by those who were higher on neuroticism might provide more short-term relief, while other strategies (such as approaching the situation or talking to those involved) might have more of an effect on mood in the longer term. Thus, it could be the case that people who are more prone to distress (such as those higher on neuroticism) tend to focus more on immediate mood-improvement rather than long-term mood improvement. Future research might attempt to tease apart these distinctions.

The current study also has implications for smoking-cessation treatments. Many existing psychological interventions for smoking-cessation include components preparing smokers for

stressors that could lead to a relapse and encouraging the development of non-smoking coping strategies. Our research suggests that depressed smokers may have different needs in terms of coping skills training than non-depressed smokers, and that coping expectancies might be addressed specifically in these treatments. Presence of depressive symptoms or neuroticism may suggest a propensity towards disengagement coping strategies. Therapists might thus encourage their clients to examine their beliefs about the efficacy of certain coping strategies, and might encourage experimentation with different (perhaps more active) coping behaviors.

Several methodological limitations should be considered in interpreting the results. Responses to the modified SCPQ were suggestive of the dimensions of engagement and disengagement coping. Although distinctions such as this one are among the most common in the coping research (Skinner & Edge, 2003), these dimensions may be overly broad (Coyne & Racioppo, 2000) and even so do not encompass all possible reactions to stressful situations. We may have missed important ways in which people might respond to the negative life events outlined by the vignettes. As the current sample was relatively small ($N = 72$), this factor structure may not be highly reliable and may not generalize to other samples.

The methodology of the SCPQ, while an improvement over many existing questionnaire measures, is also limited in that it asks participants to project what they would do in a stressful situation. Measuring coping behaviors in “real time” (as might be done using a hand-held computer) would be preferable.

In this study, expectancies for coping behaviors were limited to mood-regulation expectancies. Certainly, individuals hold a variety of expectancies for behaviors, such as whether or not the behavior will solve a problem, whether it will advance their personal goals and values, etc. Even mood-regulation expectancies may vary as to whether they are short-term (I expect this action to make me feel better immediately) or long-term (I expect that ultimately, when the situation is resolved, I will feel better), a distinction not considered in our study.

The ways in which depressed smokers cope with stressful life events or negative affect may have implications for success of smoking cessation attempts, but our study did not assess these variables in the context of a quit attempt. Finally, the cross-sectional nature of the study precludes drawing clear causal conclusions.

In conclusion, in a sample of adult daily cigarette smokers, depression and neuroticism were associated with the projected use of disengagement coping strategies, as well as with favorable mood-regulation expectancies for disengagement coping strategies. The projected use of coping strategies was closely related to outcome expectancies for them, regardless of participants' levels of depression or neuroticism.

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Table I
Descriptive Data: Depressive Symptoms, Neuroticism, and Smoking Variables

BDI-II	
M (SD)	10.68 (10.22)
Neuroticism	
M (SD)	31.16 (9.91)
Number of Cigarettes smoked per day	
M (SD)	15.72 (7.89)
FTND	
M (SD)	4.57 (2.34)

Note. BDI-II=Beck Depression Inventory II; NEO=NEO-FFI-N Five Factor Inventory, Neuroticism Scale. Average No. of Cigarettes Smoked Per Day estimated by participant in smoking history questionnaire; FTND=Fagerström Test for Nicotine Dependence.

Table II
Factor Loadings of Projected Use of Coping Strategies

Disengagement ($\alpha=.85$)	factor loading
eat/drink/smoke	.86
avoid people involved/withdraw from situation	.87
seek immediate gratification	.82
fade out/look for distractions	.73
behave passively/wait for something to happen	.66
Engagement ($\alpha=.83$)	
make clear to myself what is at stake and what I should do	.84
be positive; relax	.79
approach/talk to those involved	.73

Note. Items taking from modified Stress & Coping Process Questionnaire (SCPQ). Only significant loadings are included. Loadings $>.60$ deemed significant, as per Stevens's (1992) suggestion of doubling the critical value for a Pearson's correlation coefficient ($n=72$, $p<.01$, two-tailed).

Table III
Depressive Symptoms, Neuroticism, and Projected Use of Coping

	BDI-II	NEO-FFI-N
<u>zero-order correlations</u>		
Engagement	-.21	-.29 [*]
Disengagement	.36 ^{**}	.53 ^{**}
<u>partial correlations</u>		
Engagement	-.03	-.20
Disengagement	.02	.42 ^{**}

Note. (n=70). BDI-II=Beck Depression Inventory II; NEO-FFI-N=NEO Five Factor Inventory, Neuroticism Scale. BDI-II partial correlations control for NEO-FFI-N; NEO-FFI-N partial correlations control for BDI-II.

*
p<.05,

**
p<.01.

Table IV
Depressive Symptoms, Neuroticism, and Mood-Regulation Expectancies for Coping

	BDI-II	NEO-FFI-N
<u>zero-order correlations</u>		
Engagement	-.15	-.26 [*]
Disengagement	.29 [*]	.42 ^{**}
<u>partial correlations</u>		
Engagement	.03	-.21
Disengagement	.01	.32 ^{**}

Note. $n=70$. Engagement subscale of SCPQ includes items: make clear to self what is at stake, be positive/relax, and approach/talk to those involved. Disengagement subscale of SCPQ includes items: eat/drink/smoke, avoid people involved/withdraw from the situation, seek immediate gratification, fade out/look for distractions, behave passively/wait for something to happen. BDI-II=Beck Depression Inventory II; NEO=NEO-FFI-N Five Factor Inventory, Neuroticism Scale. BDI-II partial correlations control for NEO-FFI-N; NEO-FFI-N partial correlations control for BDI-II. All correlations Pearson's r .

^{*}
 $p<.05$,

^{**}
 $p<.01$.