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“Cognitive Coping Skills and Depression Vulnerability Among Cigarette Smokers”

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Abstract

Cigarette smokers vulnerable to depression experience considerable difficulty quitting smoking, possibly because they use smoking to manage negative affect and possess underdeveloped alternative coping skills for doing so. Efforts to adapt cognitive behavior therapy (CBT) of depression to the treatment of depression-vulnerable smokers have achieved inconsistent results. This research tested one possible explanation for these mixed results, the possibility that depression-vulnerable smokers are not actually deficient in the skills taught in CBT. Regular smokers with a history of major depression, but not currently in a depressive episode ($n = 66$), scored worse than did never-depressed smokers ($n = 68$) on the Ways of Responding (WOR; Barber & DeRubeis, 1992) test of skills for coping with negative moods and automatic thoughts. Results were similar in analyses using self-rated depression proneness, rather than interview-based diagnosis of past major depression, as the marker of depression vulnerability. Results were (nonsignificantly) stronger for Caucasian ($n = 54$) than for African American ($n = 73$) smokers. Implications for future research on cognitive coping, CBT, and smoking are discussed.

Key words: Depression proneness, cigarette smoking, cognitive behavior therapy, coping skills

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Cognitive Coping Skills and Depression Vulnerability Among Cigarette Smokers

Depressed people are overrepresented among current smokers, especially smokers high in nicotine dependence (e.g., Breslau, Kilbey, & Andreski, 1991). Moreover, they have a harder time achieving and maintaining abstinence than do nondepressed smokers (Glassman, 1993). This difficulty in quitting has been observed even with low, subclinical levels of depressive symptoms (Niaura et al., 2001) or a history of depression in the absence of current depression (Kenford et al., 2002), which is the focus of the research reported in this article.

A history of depression may serve as a marker of current depression vulnerability (Coyne, Pepper, & Flynn, 1999), and depression-vulnerable smokers are especially likely to use smoking as a means of managing negative affect (Lerman et al., 1996). Therefore, smoking cessation would seem to deprive depression-vulnerable smokers of one of their most dependably available and effective mood-regulating coping skills, which could account for the difficulty they experience in trying to quit. Consistent with this conjecture are findings indicating that smoking cessation selectively increases depressive symptoms (Niaura et al., 1999) and negative mood (Hall et al., 1996) among smokers with a history of major depression, and that increases in negative mood upon quitting smoking predict relapse (Covey, Glassman, & Stetner, 1998; Kenford et al., 2002).

Treatments for depression may therefore be useful in helping depression-prone smokers achieve abstinence. One plausible treatment for this purpose is cognitive behavior therapy (CBT; Beck, Rush, Shaw, & Emery, 1979). Extensive research supports the efficacy of CBT, which is classified as a “well-established” depression treatment by the Task Force on Psychological Interventions (Chambless et al., 1998). The hypothesis that CBT techniques could be adapted from treatment of depression to

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treatment of depression-vulnerable smokers has been tested in a series of studies in which the CBT packages draw from aspects of Beck's cognitive therapy (Beck et al., 1979) as well as from Lewinsohn's behavior therapy for depression (e.g., Zeiss, Lewinsohn, & Munoz, 1979).

Results from such studies are mixed and inconclusive (Niaura & Abrams, 2002). Hall, Munoz, and Reus (1994) compared two treatment conditions. In one, a 5-session cognitive-behavioral "mood management" group treatment based on CBT of depression was added to a standard health-education-based program for smokers; in the other, the health-education program alone was included. Treatment condition interacted significantly with depression history in predicting one-year follow-up results. The mood management treatment was effective only for depression-history-positive smokers. The same result was obtained by Hall et al. (1998). However, a third clinical trial by the same research group equated the two conditions for therapy contact time and failed to replicate this significant interaction (Hall et al., 1996). One study using a similar protocol to Hall's found that CBT significantly enhanced the efficacy of a behavioral treatment based on nicotine fading and self-monitoring in the treatment of depression-history-positive smokers, even with therapy contact time controlled (Patten et al., 1998). However, this result does not resolve the mixed findings from the studies by Hall and her colleagues because (a) all participants had a history of alcohol dependence, and it is not known whether the results would generalize to other smokers, (b) the sample was small ($N = 29$ total), which decreases the precision of treatment effect estimates, and (c) all participants were positive for a history of depression, so there is no way to determine whether the beneficial impact of CBT mood management training was specific to this group.

There are a range of possible explanations of these variable results in clinical trials of CBT for depression-history-positive smokers. For one, the primary premise of

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the incorporation of CBT principles into smoking cessation interventions for depression-vulnerable smokers may be mistaken. In particular, the design of these treatment programs presumes that depression-vulnerable smokers are deficient in the skills taught in CBT, such that learning the skills would be novel for them and bolster their ability to manage negative affect during early maintenance and therefore avoid relapse.

Although it is not certain what mediates the impact of CBT on depression (Solomon & Haaga, in press), one viable hypothesis is that a key mediator is learning new skills useful in regulating and delimiting episodes of sadness and negative thinking (Barber & DeRubeis, 1989). This hypothesis is consistent with evidence that (a) CBT is equally effective as antidepressant medication in the short term in relieving depressive symptoms, but the impact of CBT may be more durable (DeRubeis & Crits-Christoph, 1998); (b) Depressed people rated at post-treatment as highly skilled in responding to their own negative automatic thoughts were especially likely to maintain improvement in their depressive symptoms through 6-month followup (Neimeyer & Feixas, 1990); and (c) Depressed patients appear to be deficient in a normal metacognitive monitoring process of “double-checking” dysfunctional thoughts (Sheppard & Teasdale, 2000), which may be corrected in CBT as they learn to distance themselves from automatically accepting the validity of such thoughts as they occur (Teasdale et al., 2000).

In order to understand the variable results of efforts to adapt CBT for depression specifically to target depression-history-positive smokers, then, it would be helpful to know whether such smokers are indeed deficient in the skills being taught in CBT. Rabois and Haaga (1997) tested the interrelations of smoking status, depression history, and cognitive coping skills. A positive depression history was inferred from ratings on a self-report inventory of lifetime depression, and cognitive coping skills were indexed by the Ways of Responding test (WOR; Barber & DeRubeis, 1992). Participants with a history of depression, whether smokers or not, scored significantly

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higher on the “Negative” scale of the WOR than did their never-depressed counterparts. Thus, smokers with a history of depression were more often rated as responding to negative automatic thoughts with cognitions considered negative and dysfunctional from the standpoint of CBT (e.g., catastrophizing, overgeneralizing implications of negative situations). At a more molar level of analysis of cognitive coping, however, history of depression did not significantly relate to coping skill. Smokers scored lower than nonsmokers in overall quality of response to negative automatic thoughts on the WOR, and the trend was for depression-history-positive participants to score lower, but not significantly so ($p < .13$).

The current study was designed to replicate and extend in several ways the research by Rabois and Haaga (1997). First, we recruited larger samples of depression-history-positive and history-negative smokers. The nonsignificant difference in molar ratings of Quality on the WOR was inconclusive given that there were only 41 smokers (18 with positive history of depression) in Rabois and Haaga (1997). Second, we measured depression history on the basis of a structured diagnostic interview rather than a self-rating symptom measure.

Third, we added a continuous-variable, self-rating measure of current depression vulnerability. A history of depression may be an imprecise indicator of vulnerability (Just, Abramson, & Alloy, 2001). Some never-depressed persons are actually high in vulnerability but have not experienced a depressive episode as yet because no sufficiently major stressor has occurred to activate this vulnerability. As such, some history-negative-but-vulnerable smokers would be, in effect, false negatives if vulnerability is identified solely on the basis of prior experience of major depression. Conversely, whatever method (self-help or formal therapy) enabled the recovered depressed person to recover in the first place may also have decreased their vulnerability to future episodes. If so, there may be false positive cases as well in a

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depression-history design--smokers with a history of major depression but who are now no more vulnerable to subsequent depressive episodes than an average history-negative smoker. These considerations imply that clearer, more robust findings may emerge if current depression vulnerability, rather than history of depression, is measured. Brandon et al. (1997) obtained results consistent with this possibility. An adaptation of cognitive behavior therapy principles, "negative affect reduction counseling", proved specifically effective for smokers high in depression vulnerability as measured by the self-rating Depression Proneness Inventory (DPI; Alloy et al., 1987). In a subsequent study, the DPI was positively correlated with being a current smoker, with having ever smoked, and with reporting negative mood reduction as a motive to smoke (Brody, 2001).

Finally, we evaluated whether the association of depression proneness and cognitive coping skills among smokers would be the same for African Americans as for Caucasians. The research establishing depression as a correlate of cigarette smoking has not focused specifically on African Americans. Although overall prevalence of cigarette smoking is equal for African Americans and Caucasians (CDC, 2001), African Americans appear to start smoking later (U. S. Department of Health and Human Services, 1998) and are less likely to become nicotine dependent given that they smoke (Breslau, Johnson, Hiripi, & Kessler, 2001). It is possible that psychosocial correlates of smoking vary by ethnicity as well (Klonoff & Landrine, 1999).

In sum, we studied whether depression vulnerability among currently nondepressed smokers is associated with a deficiency in cognitive coping skills taught in CBT for depression. In so doing we addressed measurement issues by indexing depression vulnerability both as a history of major depression and by the potentially more sensitive indicator of self-rated depression proneness, and we compared African American and Caucasian subsamples with respect to the validity of the main

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hypothesis.

Method

Participants

Participants were 134 adult (age at least 18 years) cigarette smokers (at least 10 cigarettes per day), ranging in age from 18 to 70 years ($M = 41.5$, $SD = 12.6$). There were 67 women (31 African American, 31 Caucasian, 5 of other races or unknown) and 67 men (42 African American, 23 Caucasian, 2 of other races or unknown). Participants were recruited via newspaper advertisements for “psychology research” seeking “cigarette smokers (at least 10 cigarettes/day) who are not currently depressed and not taking antidepressant medication (may have history of depression).” Potential participants were excluded if they met criteria for a current major depressive episode (MDE), had met MDE criteria in the past two months, had received antidepressant medication or psychotherapy in the past two months, scored 16 or higher on the Beck Depression Inventory, or scored 1 or higher on the first five items of the Beck Scale for Suicide Ideation. The requirement of at least two months of asymptomatic functioning to define recovery from major depression is consistent with recommendations of the MacArthur Foundation Research Network on the Psychobiology of Depression (Frank et al., 1991). The requirement of no current suicidality was a safety precaution in view of the potentially stressful nature of some of the assessments.

Materials

Smoking and smoking cessation history and demographic data were collected via brief, face valid questionnaires. Also, for sample description purposes, participants completed measures of nicotine dependence and of contemplation of quitting smoking. Nicotine dependence was indexed by the Fagerstrom test for Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991), a 6-item scale (e.g., “How soon after you wake do you smoke your first cigarette?”) with evidence of

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moderate internal consistency ($\alpha = .64$) and positive correlations with years of smoking, a measure of “addiction” as a motive to smoke, and cotinine level (Pomerleau, Carton, Lutzke, Flessland, & Pomerleau, 1994). To assess contemplation of smoking cessation, we used the Contemplation Ladder (Biener & Abrams, 1991), a 0–10 measure of the extent to which smokers are considering quitting. In a worksite sample, Contemplation Ladder scores significantly predicted later attendance at an educational program about smoking and its health risks (Biener & Abrams, 1991).

Depressive symptoms were measured with the Beck Depression Inventory (BDI; Beck et al., 1979). The BDI is a 21-item self-report measure of current depressive symptom severity with extensive evidence of high internal consistency and high convergent validity with interviewer ratings of depression severity (Beck, Steer, & Garbin, 1988).

The Beck Scale for Suicide Ideation (BSI; Beck, Steer, & Ranieri, 1988) is a 19-item self-report measure of suicidality that correlated over .90 with clinical ratings of suicide ideation (Beck, Steer, & Ranieri, 1988). The first five items comprise an overview of suicidality and were used to screen out potentially suicidal people (i.e., anyone scoring above 0).

Assessment of a history of major depression, and for exclusionary purposes current major depression, was based on relevant portions of the Structured Clinical Interview for DSM-IV (SCID-I/NP; First, Gibbon, Spitzer, & Williams, 1995), conducted by clinical psychology graduate students trained by a psychologist with extensive experience using the SCID in research and practice. All diagnostic interviews (SCID) were audiotaped. Twenty of these tapes were randomly selected for reevaluation by the supervising psychologist, who was unaware of the diagnosis assigned by the interviewer. Agreement between these ratings and those of the original diagnostician was 100% in relation to the recovered-depressed vs. never-depressed distinction.

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The Depression Proneness Inventory (DPI; Alloy, Hartlage, Metalsky, & Abramson, 1987) is a 10-item self-report measure of vulnerability to depressive reactions to stress. The DPI is face valid, as the questions ask about proneness to depression (e.g., "Would your friends who know you best rate you as a person who easily becomes very depressed, sad, blue, or down in the dumps?"). Each item is rated on a 1-7 Likert-type scale, and the total DPI score is the sum of the item scores (i.e., 10-70). The DPI is highly internally consistent ($\alpha = .90$ in nonclinical samples) and stable (one-month retest reliability $r = .88$) (Alloy et al., 1987). The DPI has correlated positively with current depressive symptoms and with number of past episodes of major or minor depressive disorder, but not with past episodes of anxiety disorders, mania, or drug and alcohol abuse (Alloy et al., 1987), supporting its specificity to depression proneness. A prospective study in an undergraduate sample supported its predictive validity in that DPI scores from the beginning of an introductory psychology course predicted increased depressive symptoms in the wake of a poor performance on a midterm examination above and beyond what could be predicted on the basis of time 1 depression scores (Alloy et al., 1987). In a clinical trial of smoking cessation methods, smokers who lapsed even once during the first week after a quit attempt had scored higher on the DPI at baseline than did those who maintained abstinence during the first week (Smith et al., 2001).

Cognitive coping skills were measured with the Ways of Responding test (WOR; Barber & DeRubeis, 1992), developed to index depressed patients' mastery of skills for coping with negative automatic thoughts. WOR scores were moderately stable across a 12-week interval and correlated in the expected manner with measures of learned resourcefulness, attributional style, and psychological well-being (Barber & DeRubeis, 1992). As noted in the Introduction, WOR data have been related to depression history among cigarette smokers (Rabois & Haaga, 1997). Also, the Positive subscale of the

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WOR (see below) interacted with state happiness after a mood induction to predict temptation to smoke in a laboratory study (Rabois & Haaga, in press).

For each of 8 scenarios included in the WOR, the participant is asked to imagine an upsetting event. In 6 of these scenarios, accompanying negative, depressotypic automatic thoughts are also provided. The participant identifies his or her emotional response and rates its intensity on a 0-100 scale. Then the participant rates on 0-100 scales how well she or he can imagine the event and the negative thought. The next step is to write down additional thoughts and possible plans for thinking or acting in such a way as to manage the negative situation; these thoughts form the basis for the main use of WOR data (see below). Finally, the intensity of the emotional response is rated again. The format of the WOR thus corresponds closely to that of a 5-column Daily Record of Dysfunctional Thoughts, the use of which for cognitive self-monitoring and coping skill development is a core strategy in cognitive therapy (Beck et al., 1979).

Cognitive coping skill as measured with the WOR is based upon independent raters' judgments, not participants' views of how skillful they are. In particular, participants' open-ended thoughts listed in response to WOR scenarios and WOR-provided initial negative automatic thoughts are subjected to content analysis by trained raters. The thoughts are divided into individual 'thought units', then assigned to one of 25 possible coding categories. Two psychology graduate students with extensive training in WOR coding, working independently and masked to depression history as well as other information regarding participants, scored each thought unit in relation to the 25 coding categories. Disagreements are settled by a third rater. The consensus ratings resulting from this procedure are then recorded as Positive, Negative, or Neutral according to the subscale definitions devised by Barber and DeRubeis [1992] on the basis of expert cognitive therapists' ratings regarding which thoughts would be dysfunctional [Negative subscale] or functional [Positive subscale] in coping with

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negative events and automatic thoughts. Neutral thoughts play no further role in the analysis. To correct for differences based on verbosity of participants, we divided Negative and Positive responses by total number of thought units. For instance, a participant with 14 Positive responses, 4 Negative, and 2 Neutral would receive scores of .7 for WOR Positive and .2 for WOR Negative.

All three raters also made subjective 1--7 Quality judgments concerning each scenario in its entirety (not individual thought units), with 1 reflecting coping thoughts least likely to improve one's mood and meet the demands of the situation, and 7 meaning most likely to improve mood and manage the situation effectively. For analyses involving this WOR-Quality variable, scores are averaged across the 8 scenarios and across the three raters.

Reliability of WOR coding was excellent. Because subsequent analyses utilized the average of the raters' scores, we measured reliability with the Spearman-Brown version of the intraclass correlation coefficient (ICC), which gives the estimated dependability of the average of raters' scores (Bartko, 1976). ICC's were .98 for WOR-Negative and .99 for WOR-Positive; these two analyses were based only on the first two raters, as the third rater was used as a tiebreaker in the case of disagreements for these subscales. The ICC for WOR-Quality, based on all three raters, was .99. These findings replicate those of Barber and DeRubeis (1992), who reported very high interrater reliability.

Procedure

After providing informed consent, participants completed the BDI, BSI, and demographic and smoking questionnaires, and were interviewed with portions of the SCID relevant to diagnosing current major depressive episode. If the participant met all inclusion criteria for the study, then she or he completed in random order (a) non-exclusionary portions of the SCID including lifetime MDE, (b) a think-aloud cognitive

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assessment task not relevant to this report, and (c) the WOR and a series of questionnaires including the ones relevant to this study (FTND, DPI, Contemplation Ladder), themselves presented in random order. Finally, participants were thanked, debriefed, and compensated \$25 for their time.

Results

Convergent Validity of Depression Vulnerability Indicators

There was a positive association of SCID-derived diagnoses of past major depression with self-rated current depression proneness (Depression Proneness Inventory). Those diagnosed with past major depression ($n = 65$, $M = 30.63$, $SD = 8.96$) scored significantly higher on the DPI than did those with no history of major depression ($n = 68$, $M = 21.67$, $SD = 8.14$), $t(131) = 6.05$, $p < .001$, effect size $d = 1.05$ (Cohen, 1988). As argued in the Introduction, we do not view these measures as interchangeable, but we would certainly expect a positive and significant association, and this result supports the convergent validity of each measure of depression vulnerability.

Sample Description

Descriptive data on smoking, symptom, and coping variables appear in Table 1. On average, current depressive symptom scores were low, as would be expected given the inclusion criterion of not being in a major depressive episode currently. The DPI mean of 26.0 is close to that (28.6) of a large, diverse adult sample ($N = 487$) recruited from the same metropolitan area for a study of depression and smoking at the National Cancer Institute (Brody, 2001). Our sample reported smoking almost a pack a day and having smoked for an average of over 20 years. A majority (59%) reported having made at least one serious and deliberate attempt to quit smoking; this subsample reported a mean of 3.23 ($SD = 3.09$) prior failed attempts to quit. The mean of 5.76 on the Contemplation Ladder is similar to average scores in unselected samples of regular

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smokers (i.e., not presenting for treatment for smoking cessation) (Biener & Abrams, 1991; McDermut & Haaga, 1998) and slightly exceeds the midpoint of 5, which corresponds to the verbal anchor “Think I should quit but not quite ready”.

History of Major Depression and Cognitive Coping Skills

Cognitive coping skill scores as a function of history of major depression are presented in Table 2. Consistent with our hypotheses, recovered depressed smokers scored higher on WOR-Negative, lower on WOR-Positive, and lower on WOR-Quality than did never-depressed smokers. The difference on WOR-Quality was not significant, however ($p = .056$). Effect sizes for these comparisons ranged from $d = .33$ to $.45$, falling between what are conventionally considered “small” (.2) and “medium” (.5) effects (Cohen, 1988). Point-biserial correlations, as recommended by Rosenthal, Rosnow, and Rubin (2000), are also presented in Table 2.

Self-Rated Depression Proneness and Cognitive Coping Skills

Self-rated depression proneness (Depression Proneness Inventory total scores) was significantly correlated, as predicted, with cognitive coping skill as measured by the Ways of Responding test, with effect sizes again a bit below “medium” (Cohen, 1988; r of .30). In particular, DPI scores correlated inversely with WOR-Quality ratings, $r = -.28$, $p < .001$ and WOR-Positive skill ratings, $r = -.25$, $p < .01$. DPI scores correlated positively with WOR-Negative scores $r = .23$, $p < .01$. Thus, the pattern and magnitude of effects are similar regardless of depression vulnerability indicator, though the association with WOR-Quality ratings was significant only for the DPI.

Race Differences in the Association of Cognitive Coping and Depression Vulnerability

Relations of cognitive coping skills variables (WOR-N, WOR-P, WOR-Q) with depression vulnerability markers (Depression Proneness Inventory total scores, presence/absence of past major depression based on the SCID), separately for African American and Caucasian smokers, are presented in Table 3. In no case were the

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associations significantly different by race. However, in every case the absolute value of the association of cognitive coping with depression vulnerability was stronger among Caucasian participants. In several instances the differences are trivial, but not all. For example, the relationships are all approximately “medium” by convention for Caucasians (r 's of .30 absolute value, d 's of .50), while several are “small” or even weaker (r 's of .10, d 's of .20) effects among African Americans.

Discussion

Among smokers not currently experiencing a major depressive episode, those with a history of major depression showed less functional cognitive coping skills from the standpoint of cognitive behavior therapy (CBT). This result bolsters a key premise of efforts to use adaptations of CBT for depression to help depression-vulnerable smokers cope better with negative affect and thereby be more likely to achieve smoking cessation. Our results replicate and extend those of Rabois and Haaga (1997) in this regard.

We began this research with the aim of trying to account for mixed results regarding a possible specific advantage for depression-vulnerable smokers from adapting CBT for depression to the context of smoking cessation. Our results refute the possibility that specific effects are elusive because depression-vulnerable smokers are not lacking in the skills taught in CBT, so we need to look elsewhere to understand these effects. We perceive several remaining alternative explanations, each having implications for future research.

First, perhaps a selective advantage for CBT with depression-vulnerable smokers exists, but is relatively modest in relation to robust comparison conditions. Given that the clinically significant outcome of smoking cessation treatments is dichotomous (sustained abstinence or not), and the effect of interest is an interaction (treatment type X depression vulnerability), statistical power is a critical issue. Modest

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increases in the probability of achieving abstinence for a sizable subgroup (depression-vulnerable) of smokers would be an important public health outcome, but difficult to detect consistently in individual studies, as opposed to meta-analyses.

Second, the measurement of depression vulnerability may be a critical factor. Our findings were generally equivalent whether depression vulnerability was measured via interviewer-rated history of depression, as in past research, or by the self-rating Depression Proneness Inventory (DPI). The only difference was that in a few instances (association with WOR-Quality for the entire sample, with all three WOR variables for the Caucasian subsample) associations were statistically significant with the DPI and nonsignificant in the same direction with the SCID. This difference coincides with the decreased power typical of statistical tests involving dichotomized variables such as the recovered depressed vs. never depressed classification. Thus, measurement of depression vulnerability did not prove critical in understanding our findings, but this issue still merits attention in future research. It is possible, for instance, that a dichotomous depression history marker is overinclusive as a measure of depression proneness. Brown and colleagues found that techniques adapted from CBT for depression were specifically effective for smokers with a history of at least two depressive episodes, but not one (Brown et al., 2001). Alternatively, facilitated cognitive processing of negative information about the self was evident only among formerly depressed people who had experienced at least four prior depressive episodes in a study by Rude and colleagues (Rude, Covich, Jarrold, Hedlund, & Zentner, 2001). Additional research is needed to identify parameters of depression proneness among the formerly depressed.

Third, it may be that depression-vulnerable smokers are deficient in the cognitive coping skills taught in CBT, but that the group treatments offered to smokers have not been sufficiently thorough to improve these skills. No studies have directly measured

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the impact of group CBT for smokers on cognitive coping skills. The most extensive evidence that CBT is effective for depression comes from studies of individual treatment, in which it is possible to tailor one's interventions to the specific patient. The evidence supporting group psychotherapies for depression is encouraging but is based upon fewer, and less methodologically rigorous, trials (McDermut, Miller, & Brown, 2001). In conducting research on whether group CBT improves coping skills of smokers, it would also be valuable to explore alternate conceptualizations of functional vs. dysfunctional coping. For example, depressed mood was associated with ruminative coping particularly among smokers in one study (Richmond, Spring, Sommerfeld, & McChargue, 2001), suggesting that "by heightening attentional focus, nicotine may increase ruminators' ability to focus on negative thoughts, augmenting depressed mood" (Richmond et al., 2001, p. 836).

Finally, links among dysfunctional cognitive coping, depression vulnerability, and difficulty quitting smoking may characterize only a subset of smokers, with the result that findings of studies ignoring these moderating variables will be inconsistent. Our results speak to a couple of such possibilities. We found depression proneness and cognitive coping skills to be (nonsignificantly) less strongly associated among African Americans than among Caucasians. This result is tentative and in need of corroboration in larger samples. However, it is noteworthy that an earlier study of African American adults found no association of depressive symptom severity with cigarette smoking, though there was an association of depression and alcohol use (Williams & Adams-Campbell, 2000). One possible explanation for this apparent race difference could be race differences in the D4 dopamine receptor gene (D4DR). Lerman and her colleagues found in the context of a smoking cessation trial that Caucasians were especially likely to have short alleles in D4DR genotyping, and a correlation between negative-affect-reduction smoking and depressive symptoms was

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found only among those with short alleles (Lerman, Caporaso, Main, Audrain, Boyd, Bowman, & Shields, 1998). Such findings highlight a need to study smoking and smoking cessation specifically among African Americans rather than assuming that results obtained in predominantly Caucasian samples will generalize to all races and ethnic groups.

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Table 1
Descriptive Statistics for Smoking, Depression, and Coping Variables

Variable	M	SD	N
Cigarettes/Day	16.88	6.93	133
Years of Smoking	22.85	13.50	133
Fagerstrom Test for Nicotine Dependence	4.74	2.08	129
Contemplation Ladder	5.76	2.67	132
Beck Depression Inventory	5.47	4.00	134
Depression Proneness Inventory	26.00	9.69	128
WOR-Quality (1-7)	4.42	0.60	134
WOR-Positive	.68	.17	134
WOR-Negative	.29	.17	134

Note. WOR = Ways of Responding test.

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Table 2
Cognitive Coping Skills (Ways of Responding) as a Function of History of Major Depression Among Cigarette Smokers

	Recovered Depressed (<u>N</u> = 66) M (SD)	Never Depressed (<u>N</u> = 68) M (SD)	t (132)	p	d	r _{pb}
WOR-P	.64 (.16)	.72 (.18)	2.62	.01	.45	.22
WOR-N	.33 (.16)	.26 (.17)	2.44	.02	.42	.21
WOR-Quality	4.32 (.66)	4.51 (.52)	1.93	.06	.33	.17

Note. WOR = Ways of Responding test (WOR-P Positive subscale, WOR-N Negative subscale).

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Table 3
Cognitive Coping and Depression Vulnerability for African Americans and Caucasians

		WOR-N		WOR-P		WOR-Q		
r with DPI	African American	.11		-.09		-.23		
	Caucasian	.30*		-.36**		-.28*		
		RD		ND		T	D	R_{pb}
		M	SD	M	SD			
WOR-N	African American	.30	.13	.24	.19	1.56	.37	.18
	Caucasian	.35	.18	.28	.12	1.59	.45	.21
WOR-P	African American	.67	.13	.74	.19	1.59	.38	.19
	Caucasian	.62	.19	.70	.13	1.71	.48	.23
WOR-Q	African American	4.47	.54	4.52	.47	0.43	.10	.05
	Caucasian	4.19	.76	4.53	.45	1.81	.51	.24

Note. N = 72 African Americans and 52 Caucasians for DPI correlations. N = 73 African Americans (43 ND, 30 RD) and 54 Caucasians (20 ND, 34 RD) for History of Depression mean comparisons. RD = Recovered Depressed. ND = Never Depressed. DPI = Depression Proneness Inventory. WOR = Ways of Responding (P = Positive, N = Negative, Q = Quality). * $p < .05$. ** $p < .01$