

Nicotine Dependence, Depression, and the Moderating Role of Goal Cognitions

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The authors examined the moderating role of goal cognitions in the process of nicotine dependence in young adult smokers. A college sample of 85 male and 78 female smokers completed measures of nicotine dependence and psychological distress. They also provided cognitive evaluations for goals related to smoking cessation on scales measuring self-efficacy, value, planning, self-reward, self-criticism, self-monitoring, social comparison, and positive and negative goal-based arousal. As has been previously established, depression had a direct and significant effect on nicotine dependence. Moreover, significant interactions between goal cognitions and depression provided evidence for the hypothesized moderating effect.

Nicotine is a highly addictive substance, comparable in its physiological properties to other addictive substances of potential abuse (U.S. Department of Health and Human Services, 1988). In understanding the psychological correlates of nicotine dependence, the study of depression has proven to be extremely important. Smokers are more likely than nonsmokers to have a major history of depression, depression is an important predictor of an individual's success with quitting smoking, and the presence of depression has been found to increase the risk of progression to nicotine dependence (Breslau, Kilbey, & Andreski, 1993; Hall et al., 1996).

In an attempt to address the challenges faced by depression-vulnerable smokers, treatment researchers have adapted therapeutic techniques proven effective in the treatment of depression to help smokers quit. With few exceptions, however, researchers have failed to replicate such efforts (cf. Hall et al., 1996). One provocative explanation offered by Baumeister, Bratslavsky, Muraven, and Tice (1998) is that coping with negative affect requires self-control and, after such efforts are made, subsequent attempts at self-control in other areas, such as smoking, are more likely to fail. This interpretation is consistent with those of others who have suggested that negative affect may undermine people's ability to restrain their smoking behavior (Breslau et al., 1993; Brownell, Marlatt, Lichtenstein, & Wilson, 1986).

Both the broader smoking literature and the literature on personal goals suggest that people who are successful at quitting on their own make comprehensive prior plans and use a greater number of strategies in dealing with temptation. Along with goal planning, other self-control related variables, such as self-efficacy

in quitting and self-monitoring strategies, have also been linked to success at curbing nicotine dependence (Brownell et al., 1986; Hughes, 1988).

Although effective planning, self-monitoring, and self-efficacy in quitting have been shown to be important for all smokers in previous research, we suggest that these variables should be especially important for depressed smokers, because their self-control resources are already taxed by their depression (Baumeister et al., 1998). In this article we argue that among smokers such self-control resources may take the form of cognitive self-regulatory strategies (collectively called *goal cognitions*).

Although the putative links between nicotine dependence and depression have been widely considered, we are aware of no study that has examined whether self-control related variables act to moderate or reduce the strength of depression on nicotine dependence. Identifying moderators may help to refine interventions by allowing researchers to target specific subgroups more effectively. For example, low self-efficacy in quitting may lead an individual to be susceptible to the negative effects of depression, as reflected in a moderator effect in which depression predicts nicotine dependence among individuals low but not high in quitting self-efficacy (Stacy, Sussman, Dent, & Burt, 1992).

Consistent with previous findings, we hypothesized that level of nicotine dependence would be higher in depressed smokers compared to nondepressed smokers. On the basis of the extant evidence, we also hypothesized that goal cognitions relating to self-efficacy, planning, and self-monitoring would act as moderators of the effects of depression on nicotine dependence among young adults trying to quit.

Method

Participants

A total of 368 undergraduates from the University of Southern California were surveyed. From this sample, 85 male and 78 female smokers ages 18–25 qualified for the study. Eligible smokers were those currently smoking at least five cigarettes a day and who were currently trying to quit. Self-reported ethnic background indicated that the sample of smokers was 42% White, 38% Asian, 12% Hispanic, and 8% African American.

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Measures

Goal Systems Assessment Battery. Karoly and Ruehlman (1995) developed the Goal Systems Assessment Battery (GSAB) to assess goal cognitions in terms of a multicomponent model of the self-regulatory process. Respondents provide an evaluative rating on a scale that ranges from *not at all accurate* (1) *this applies extremely well to how I think about my goal* (5) on items from nine subscales that combine to form four function questionnaires. In a series of studies, Karoly and Ruehlman (1995) showed the GSAB to have a consistent factor structure. One-week test-retest reliabilities ranged from .68 to .89 (Karoly & Ruehlman, 1995).

Center for Epidemiological Studies Depression Scale. The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) is a 20-item measure of current depressive symptomatology. Responses are based on a 4-point Likert-like scale (0 = *rarely or none of the time* and 4 = *most, or all of the time*). Test-retest reliabilities ranging from .51 to .67 were found with retest intervals of 2–8 weeks. Cutoff scores of 16 have been used to screen for depression in community samples.

Fagerstrom Test for Nicotine Dependence. The Fagerstrom Test for Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991) is a 6-item self-report measure of nicotine dependence. The FTND has satisfactory internal consistency (Cronbach's $\alpha = .64$) and high test-retest reliability ($r = .88$). Findings indicate that the FTND correlates with other measures of nicotine dependence (carbon monoxide, nicotine, and cotinine levels). The FTND has a range of 0–10 points, with 0 points indicating minimum physical dependence and 10 points indicating maximum dependence.

Procedure

Data were obtained through a self-report questionnaire administered to students in a laboratory by trained undergraduates. The survey was administered under anonymous conditions. Participants were asked whether they were currently involved in any one of nine common health pursuits. Respondents who reported that their most significant health goal was to quit smoking were then asked to evaluate their most important health goal using the 36 items of the GSAB. Also administered to participants were the 20-item CES-D and the 6-item FTND. Respondents received class credit for their participation.

Results

Means of Study Variables by Gender and Ethnicity

To examine potential confounding group differences, we evaluated mean levels of depression, goal cognitions, and nicotine dependence using 2 (gender) \times 4 (ethnicity) between-subjects analyses of variance. Analysis of depression indicated that depression was not significantly associated with gender or ethnicity. Compared to women, men reported higher levels of goal self-efficacy, planning, self-monitoring, and nicotine dependence. We therefore controlled for gender in our subsequent analyses.

Main and Interactive Effects

We assessed the hypothesized main effect of depression and interactive effects of goal cognitions and depression using hierarchical multiple regression procedures. We standardized the scales before forming cross-product terms and before running the regression to reduce possible multicollinearity. We performed four separate sets of regression analyses, one for each of the four scales (directive, control, regulatory, and arousal scales) indexing goal cognitions. Because of the large number of regression effects

evaluated, we performed separate regressions to maintain adequate power (Cohen & Cohen, 1983).

The specific order of the a priori component in each of the regressions in this study was as follows. First, gender was entered as a control variable. Next, all main effects were entered, in the order of depression and the subscales composing one of the four goal cognition scales. After the entry of this entire set of effects, the quadratic effect of depression and the quadratic effects of goal cognitions were entered to control for spurious moderator effects (Lubinski & Humphreys, 1990). Finally, two-way interactions of depression and goal cognitions were entered.

Because of space limitations, we summarize the results of the multiple regression analyses involving the four GSAB function scales, depression, and nicotine dependence. After controlling for gender, depression accounted for an additional 13% of the variance in the prediction of nicotine dependence. Moreover, we found significant interactions between goal self-efficacy and depression ($\beta = -.16, p < .01$) and between goal self-monitoring and depression ($\beta = -.12, p < .01$). The observed significant interactions revealed incremental utility by accounting for an additional 3%, $F(1, 156) = 3.59, p < .05$, and 2%, $F(1, 156) = 2.13, p < .05$, in nicotine dependence, respectively. These effects suggest that greater belief in the ability both to quit and to self-monitor one's progress at cessation efforts reduces the strength of depression on nicotine dependence.

Discussion

The results of this study extend previous findings concerning the association between depression and nicotine dependence among young adult smokers. Specifically, we found that depressed smokers had significantly higher scores on the continuous FTND scale than nondepressed smokers did. This investigation also furnishes suggestive new evidence concerning the importance of investigating potential moderators of the effects of depression on nicotine dependence. Specifically, goal cognitions such as self-efficacy and self-monitoring were found to significantly moderate the predictive effect of depression on nicotine dependence.

The observed effects have clinical importance. Several converging lines of evidence suggest that people with a history of depression are less likely to succeed in quitting smoking than are those with no depression history (Breslau et al., 1993). Efforts to help depressed smokers by incorporating therapeutic techniques, however, have yielded mixed results (cf. Hall et al., 1996). Baumeister et al. (1998) theorized that acts of self-control—designed, for instance, to cope with depression—may impair subsequent efforts at self-control in other areas, such as abstinence from smoking.

Rather than focus on coping with depression, our focus in this study was on cognitions related to the actual goal of quitting. The moderating effect of goal self-efficacy suggests that greater belief in one's ability to quit smoking may buffer the effects of depression on nicotine dependence. Moreover, we found that the effect of depression on nicotine dependence was moderated by goal self-monitoring. Although this result is consistent with findings observed with nondepressed smokers (Brownell et al., 1986), the present results suggest that deficits in the self-regulatory functions related to goal self-monitoring in depressed smokers may interfere with timely coping in the face of temptations to smoke.

Finally, several methodological concerns deserve attention. The obtained effects should be considered provisional because of the need to replicate cross-sectional findings with longitudinal research. Moreover, we assessed level of addiction using the FTND and examined its relation to young adult smokers' cognitive elaboration of smoking cessation goals. Although there is evidence that dependent smokers are less likely to quit than are nondependent smokers, future studies should examine goal-relevant predictors of actual success at quitting. Despite these limitations, the detection of significant moderating effects of self-efficacy and self-monitoring cross-sectionally is an important step in promoting an interactional framework in this area.

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