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Short Communication

Financial strain and cognitive-based smoking processes: The explanatory role of depressive symptoms among adult daily smokers

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HIGHLIGHTS

- It is posited that financial strain will exert an indirect effect on cognitive-based smoking processes via depressive signs
- Depressive symptoms explained link between financial strain and negative affect reduction smoking motives
- Depressive symptoms explained link between financial strain and negative mood abstinence expectancies
- Depressive symptoms explained link between financial strain and perceived barriers for quitting
- Results have implications for improving intervention programs for smoking cessation involving financial strain

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ABSTRACT

Little work has focused on the underlying mechanisms that may link financial strain and smoking processes. The current study tested the hypothesis that financial strain would exert an indirect effect on cognitive-based smoking processes via depressive symptoms. Three clinically significant dependent variables linked to the maintenance of smoking were evaluated: negative affect reduction motives, negative mood abstinence expectancies, and perceived barriers for quitting. Participants included 102 adult daily smokers (M_{age} = 33.0 years, SD = 13.60; 35.3% female) recruited from the community to participate in a self-guided (unaided; no psychological or pharmacological intervention) smoking cessation study. Results indicated that depressive symptoms explain, in part, the relation between financial strain and smoking motives for negative affect reduction, negative mood abstinence expectancies, and perceived barriers for quitting. Results indicate that smoking interventions for individuals with high levels of financial strain may potentially benefit from the addition of therapeutic tactics aimed at reducing depression.

Financial strain, reflecting an unfavorable asset-to-needs ratio, affects individuals of any SES strata who experience debt that exceeds their economic capacities and impacts their ability to afford basic necessities, such as food, clothing, housing, major household items, and other bills (Siahpush, Borland, & Scollo, 2003). Financial strain has also been found to be related to increased risk of smoking (Falba, Teng, Sindelar, & Gallo, 2005; Murayama et al., 2013; Nelson, Lust, Story, & Ehlinger, 2008; Shaw, Agahi, & Krause, 2011). Research has found that financial strain is associated with a higher probability of being a current smoker, greater smoking rate, and lower success in quitting (Kendzor et al., 2010; Reitzel, Langdon, Nguyen, & Zvolensky, 2015; Siahpush & Carlin, 2006). Smokers with more financial strain are more likely to report greater interest in quitting, but are less likely to attempt to quit (Siahpush, Yong, Borland, Reid, & Hammond, 2009).

There is a large empirical literature linking depressive symptoms and disorders to the onset and maintenance of smoking (Hitsman et al., 2013). Negative reinforcement expectancies have been found to be associated with higher levels of negative affect/emotional vulnerability in smokers (Copeland, Brandon, & Quinn, 1995). Additionally, studies

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have found financial strain is related to greater psychological distress, including depressive symptoms (Chou & Chi, 2000; Dijkstra-Kersten, Biesheuvel-Leliefeld, Wouden, Penninx, & Marwijk, 2015; Price, VanRyn, & Vinokur, 1992). However, depressive symptoms have not been directly explored in relation to financial strain and smoking processes. Theoretically, smokers with greater financial strain may be more apt to experience depressed mood, which, in turn, may be related to a corresponding tendency to engage in negative reinforcement smoking behavior to manage such aversive states, increased expectations of experiencing negative mood states during periods of brief (24-hour) smoking abstinence, and greater perceptions of difficulties in quitting.

The current study tested the hypothesis that financial strain would exert an indirect effect on cognitive-based smoking processes via depressive symptoms. Specifically, financial strain was expected to positively relate with depressive symptoms, which in turn, would be associated with negative affect reduction motives, negative mood abstinence expectancies, and perceived barriers for quitting (Brandon, 1994; Copeland & Brandon, 2000; Zvolensky et al., 2007).

1. Method

1.1. Participants

Participants included 102 adult daily smokers (M_{age} = 33.0 years, SD = 13.60; 35.3% female) recruited from communities in Burlington, Vermont and Houston, Texas. Inclusion criteria for the current study were: (1) being between 18- and 65 years of age; (2) being interested in making a serious, unaided, quit attempt; and (3) smoking a minimum of 5 cigarettes per day. Exclusion criteria were: (1) pregnancy or the possibility of being pregnant (by self-report); (2) current use of nicotine replacement therapy and/or smoking cessation counseling; (3) current or past history of psychotic-spectrum symptoms or disorders; or (4) current suicidality. The racial/ethnic distribution of this sample was as follows: 85.3% White/Caucasian; 7.8% Black/Non-Hispanic; 2.9% Hispanic; 1.0% Asian; 1.0% American Indian/Alaska Native; 2.9% Multi-racial; and 2.0% 'Others'. On average, participants reported smoking 15.6 cigarettes per day (*SD* = 6.76), smoking their first cigarette at 17.4 years of age (*SD* = 3.43), and reported being a daily smoker for an average of 14.9 years (*SD* = 12.93).

1.2. Measures

Demographics Questionnaire. Demographic data included gender (0 = male, 1 = female), age, race (0 = race other than White; 1 = White), and education (1 = grade 6 or less to 8 = completed graduate or professional school). Collected demographic information was used to describe the sample and gender, age, race and education were included as covariates.

Structured Clinical Interview-Non-Patient Version for DSM-IV (*SCID-N/P*; First, Spitzer, Gibbon, & Williams, 2007). Axis I psychopathology assessments were performed using the SCID-N/P.

Financial Strain Questionnaire (*FSQ*; Pearlin, Lieberman, Menaghan, & Mullan, 1981). The FSQ consists of 8 items adapted from an economic strain measure that assesses current perceived financial difficulty in terms of the ability to afford food, clothing, housing, major items (e.g., car), furniture/household equipment, leisure activities, and bills according to a 3-point Likert scale (Pearlin et al., 1981).

Inventory of Depression and Anxiety Symptoms (*IDAS*; Watson et al., 2007) *Depression Subscale*. The IDAS is a 64-item self-report instrument that assesses distinct affect symptom dimensions. The IDAS depression symptom subscale (IDAS-DEP; 20 items) was utilized (Cronbach's $\alpha = 0.91$).

Wisconsin Inventory of Smoking Dependence Motives (*WISDM*; Piper et al., 2004) *Negative Affect Subscale*. The WISDM comprises 68 items designed to assess 13 different theoretically-derived motivational domains on a 7-point Likert scale ranging from 1 ("*Not true of me at all*") to 7 ("*Extremely true of me*"). We elected to focus our hypothesis only on the WISDM negative affect subscale (WISDM-NA; 6 items).

Smoking Abstinence Expectancies Questionnaire (*SAEQ*; Abrams, Zvolensky, Dorman, Gonzalez, & Mayer, 2011). The SAEQ has good psychometric properties, including internal consistency, convergent and discriminant validity, and test–retest reliability (Abrams et al., 2011).

Barriers to Cessation Scale (*BCS*; Macnee & Talsma, 1995). The BCS is a 19-item self-report measure of perceived barriers associated with quitting smoking. The BCS total score was utilized.

Smoking History Questionnaire (*SHQ*; Brown, Lejuez, Kahler, & Strong, 2002; Garey et al., in press). The SHQ is a self-report questionnaire used to assess smoking history (e.g. smoking rate, age of onset of initiation), pattern (e.g. number of cigarettes consumed per day), and strategies used to quit, and problematic symptoms experienced during past quit attempts (e.g., weight gain, nausea, irritability, and anxiety).

Positive and Negative Affect Schedule (*PANAS*; Watson, Clark, & Tellegen, 1988). The PANAS is a self-report measure that assesses the extent to which participants experienced 20 different feelings and emotions on a scale ranging from 1 ("*Very slightly or not at all*") to 5 ("*Extremely*"). The PANAS negative affect subscale (PANAS-NA; 10 items) was used.

1.3. Procedure

Adult daily smokers were recruited from the community through flyers, newspaper ads, and radio announcements to participate in a self-guided quit study examining barriers to successful smoking cessation (Langdon, Farris, Hogan, Grover, & Zvolensky, 2016; Langdon, Farris, Øverup, & Zvolensky, 2015). Interested participants were scheduled for an in-person baseline assessment to determine study eligibility. Following written informed consent, participants were interviewed using the SCID-I/NP and completed a computerized self-report battery of questionnaires. Participants were compensated $20 for participating in the baseline assessment, regardless of study eligibility. The current study is based on baseline (pre-cessation data) for a sub-set of the sample, which was selected on the basis of available data on all studied variables. The study protocol was approved by the University of Houston Institutional Review Board.

1.4. Analytic strategy

Regression analyses were conducted using bootstrapping techniques through PROCESS, a conditional modeling program that utilizes an ordinary least squares-based path analytical framework to test for both direct and indirect effects (Hayes, 2013). Bootstrapping is the recommended approach when data distribution is non-normal or unknown (Kelley, 2005; Kirby & Gerlanc, 2013). An indirect effect is the product of path *a* and path *b* and is assumed to be significant if the confidence intervals (CIs) around their product do not include zero (Preacher & Hayes, 2008; Zhao, Lynch, & Chen, 2010). Kappa-squared (κ^2) was used as an indicator of effect size (Preacher & Kelley, 2011). Three models were conducted with (1) smoking motives for negative affect reduction, (2) negative mood abstinence expectancies, and (3) perceived barriers for quitting as criterion variables.

2. Results

2.1. Descriptive analyses

Zero-order correlations among all study variables are presented in Table 1. Financial strain and depressive symptoms were positively correlated (r = 0.35; 12% shared variance). Depressive symptoms were positively related to all criterion measures (r's = 0.34–0.37). Financial strain was uncorrelated to all criterion measures (all p's > 0.05).