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Anxiety Sensitivity Physical and Cognitive Concerns in Relation to Smoking-Oriented Cognition: An Examination among Treatment-Seeking Adults Who Smoke

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Abstract

Objectives—Elevated levels of anxiety sensitivity (AS; fear of anxiety and internal sensations) is highly common among adults who smoke and contributes to several maladaptive smoking beliefs and behaviors. AS is comprised of three empirically-established factors relating to fears of social concerns, fears of physical symptoms, and fears of cognitive dyscontrol. Relatively few studies have examined how these three subscales pertain to smoking processes. The aim of the present investigation was to examine, among treatment-seeking adults who smoke, the interactive effects of AS-physical and -cognitive concerns in relation to: (1) perceived barriers to smoking cessation, (2) smoking-related negative reinforcement expectancies, and (3) smoking-related avoidance and inflexibility.

Methods—Participants included 470 adults who smoke (47.8% female; Mean Age = 37.2, *SD* = 13.5), who were recruited to participate in a smoking cessation treatment study. At the baseline assessment, participants completed self-report measures, including the Anxiety Sensitivity Index-3, Barriers to Cessation Scale, Smoking Consequences Questionnaire, and Avoidance and Inflexibility Scale.

Results—Results indicated that after controlling for the effects of gender, cigarette dependence, alcohol problems, tobacco-related medical illness, current Axis I disorder, and AS-social concerns, a significant interaction emerged, such that the association between AS-cognitive concerns and the studied smoking-based cognitions were stronger among *lower* levels of AS-physical concerns (but not higher physical concerns).

Conclusions—The current findings suggest that it may be beneficial to provide specialized smoking cessation interventions for certain subgroups of adults who smoke, such as those with different AS profiles, to promote healthier beliefs about quitting.

Anxiety sensitivity (AS) is a relatively stable, but malleable, cognitive-based individual difference factor reflecting the extent to which individuals believe anxiety and anxiety-related sensations have harmful consequences (Reiss et al., 1986). The AS construct is thought to arise from a combination of genetic predispositions and social learning factors (Stewart et al., 2001; Watt et al., 1998). AS is distinguishable from the tendency to experience more frequent anxiety symptoms (trait anxiety) and other negative affect propensity variables (e.g., neuroticism; Rapee & Medoro, 1994; Zvolensky et al., 2003). More recently, empirical work has documented an association between AS and the maintenance and relapse of smoking (Leventhal & Zvolensky, 2015). Specifically, adults who smoke, and are characterized by high levels of AS, perceive quitting as more difficult (Johnson et al., 2012a) experience more severe nicotine withdrawal during the early phases of quitting (Johnson et al., 2012b) and experience greater psychological inflexibility when confronted with stressful situations (Zvolensky et al., 2014a). AS is positively correlated with beliefs that smoking will reduce negative affect (Johnson et al., 2012a), and increased positive affect after smoking (Wong et al., 2012). Elevated AS predicts greater odds of early lapse (Brown et al., 2001) and relapse (Assayag et al., 2012). Furthermore, reductions in AS appear to be related to increased rates of cessation (Zvolensky et al., 2008; Zvolensky et al., 2014b; Smits et al., 2016).

Although promising, past work on AS and cigarette smoking is limited in two key ways. First, most of past work has conceptualized AS as a single, higher-order, dimension (Leventhal & Zvolensky, 2015). However, AS is comprised of three empirically-established factors relating to fears of social concerns, physical symptoms, and cognitive dyscontrol (Naragon-Gainey, 2010). Specifically, social concerns reflect a fear of experiencing publicly observable symptoms (e.g., “It scares me when I blush in front of people”); physical concerns refer to a fear of physical symptoms associated with anxiety (e.g., It scares me when my heart beats rapidly”); and, cognitive concerns reflect a fear of mentally losing control (e.g., “When I feel ‘spacey’ or spaced out I worry that I may be mentally ill”). Among the limited work that has examined how these three subscales pertain to smoking processes, converging evidence supports distinct patterns of association between specific components of AS and smoking-related characteristics (Zvolensky et al., 2004; Guillot, Zvolensky, & Leventhal, 2015; Guillot et al., 2016). For example, AS-physical and -cognitive concerns are consistently associated with negative-reinforcement smoking expectancies (Zvolensky et al., 2004), whereas AS-social concerns tend to be related to positive-reinforcement smoking expectancies (Guillot et al., 2015; Guillot et al., 2016) This work also suggests that AS-physical and -cognitive concerns are associated with problems during past quit attempts, including more severe withdrawal symptoms (Guillot et al., 2015)

Second, research has yet to examine how the individual facets of AS might interact to influence smoking behavior. Past AS work focused on non-smoking populations and outcomes, suggests that individuals characterized by high levels of AS-cognitive concerns and low levels of AS-physical concerns may be at the greatest risk for maladaptive

cognitions and related behavior, such as increased suicidal ideation and suicide attempt history (Capron et al., 2012a; Capron, Kotov, & Schmidt, 2013). Such work, coupled with evidence for a strong link between AS-physical and -cognitive concerns and smoking processes that may directly impede quit behavior and subsequent success, provide support for investigating the interactive effects of these two subscales on smoking-oriented cognitions. Consistent with aforementioned non-smoking models (Capron 2012b; Capron et al., 2013), AS-physical concerns may, theoretically, interact with AS-cognitive concerns to promote maladaptive smoking-oriented cognitions, including smoking negative affect reduction expectancies, perceived barriers for cessation, and smoking-specific experiential avoidance.

The aim of the present investigation was to examine, among treatment-seeking adults who smoke daily, the interactive effects of AS-physical and -cognitive concerns in relation to smoking-oriented cognitions. Specifically, smoking-oriented cognitions were defined as certain beliefs that maintain smoking behavior, including: (1) perceived barriers to smoking cessation, (2) smoking-related negative reinforcement expectancies, and (3) smoking-related avoidance and inflexibility. It was hypothesized that AS-physical and cognitive concerns would demonstrate a significant interaction, such that the strength of the relation between AS-cognitive concerns and the studied smoking-oriented cognitions would vary by level of AS-physical concerns. Based on prior research suggesting that individuals characterized by high levels of AS-cognitive concerns and low levels of AS-physical concerns may be at the greatest risk for maladaptive cognitions associated with unhealthy behaviors (Capron et al., 2012a; Capron et al., 2013), higher levels of AS-cognitive concerns were expected to be associated with greater smoking-oriented cognitions of negative reinforcement expectancies, perceived barriers to cessation, and avoidance and inflexibility among individuals characterized by *lower* levels of AS-physical concerns.

Method

Participants

Participants included 470 adults who smoke, who participated in a multi-site randomized controlled clinical trial examining the efficacy of two smoking cessation interventions (Schmidt et al., 2016). Eligibility criteria for the larger study included: (1) 18–65 years of age; (2) smoking daily for at least 1 year; (3) currently smoking a minimum of 8 cigarettes per day; and (4) reported motivation to quit smoking. Exclusion criteria for the trial included: (1) current use of pharmacotherapy for smoking cessation (except the nicotine patch, which was provided by the study); (2) limited mental competency and inability to provide informed, voluntary, written consent; (3) endorsement of current or past psychotic-spectrum symptoms; (4) current suicidality or homicidality; (5) history of panic disorder; (6) history of significant medical condition; and (7) planning to relocate within the next 6 months. The sample for the current study included all participants who completed baseline assessment for the parent study.

Procedures

Data for the present study was collected during a multi-site randomized controlled clinical trial examining the efficacy of two smoking cessation interventions described in detail elsewhere (Schmidt et al., 2016). Interested persons responding to community-based advertisements (e.g., flyers, newspaper ads, radio announcements) contacted the research team and were provided with a detailed description of the study via phone. Participants were then screened for initial eligibility, and if eligible, scheduled for a baseline appointment. At the baseline appointment, participants provided written informed consent, were interviewed using the SCID-I/NP, and completed a computerized self-report assessment battery as well as biochemical verification of smoking status to evaluate eligibility criteria. The current investigation is secondary data analysis from the baseline assessment. The study protocol was approved by the Institutional Review Boards at the University of Vermont and Florida State University (clinicaltrials.gov # NCT01753141). Procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration.

Measures

Demographics Questionnaire—Demographic data used for descriptive purposes included gender, age, and race.

Structured Clinical Interview-Non-Patient Version for DSM-IV (SCID-NP; Spitzer et al., 1990; First et al., 1995)—Diagnostic exclusions and prevalence/incidence of current (past month) Axis I diagnoses were assessed via the SCID-NP (First & Westen, 2007). The interviews were administered by trained staff and supervised by independent doctoral-level psychologists. All Interviews were audio-taped and the reliability of a random selection of approximately 12.5% of interviews were checked (MJZ) for accuracy; no cases of diagnostic coding disagreement were noted. Axis I diagnosis was included as a covariate in the current study (coded: 1 = present and 0 = absent).

Medical History Form—Current and lifetime medical illnesses and current use of prescribed medication were assessed using a medical history checklist (Foster et al., 2015; Guillot et al., 2016; Schmidt et al., 2016). As in past work, for current and lifetime medical illnesses a composite variable was computed for the present study as an index of tobacco-related medical illnesses (Buckner et al., 2015). Items in which participants indicated having ever been diagnosed (respiratory disease, asthma, heart problems, and hypertension, all coded 0 = no, 1 = yes) were summed to create a total score (observed range from 0 to 4), with greater scores reflecting the presence of multiple markers of tobacco-related illnesses.

Fagerström Test for Cigarette Dependence (FTCD; Fagerström, 2011)—The FTCD is a 6-item scale that assesses gradations in tobacco dependence (e.g., “how soon after you wake up do you smoke your first cigarette;” (Heatherton et al., 1991; Fagerström et al., 2012). Scores range from 0 to 10, with higher scores reflecting high levels of physiological dependence on cigarettes. The FTCD has adequate internal consistency, positive relations with key smoking variables (e.g., saliva cotinine), and high test-retest

reliability (Heatherton et al., 1991; Pomerleau et al., 1994) In the current study, the FTCD total score was used to characterize cigarette dependence (Cronbach's $\alpha = .61$).

Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993)—The AUDIT is a 10-item self-report measure developed to identify individuals with problematic drinking. Its scores range from 0 to 40, with higher scores reflecting more problematic drinking. The AUDIT's psychometric properties are well documented (Saunders et al., 1993). In the current investigation, the AUDIT total score was used as a covariate to index current alcohol problems. The AUDIT total score demonstrated good internal consistency (Cronbach's $\alpha = .89$).

Anxiety Sensitivity Index-3 (ASI-3; Taylor et al., 2007)—The ASI-3 is an 18-item self-report measure, based in part upon the original Anxiety Sensitivity Index (ASI), that captures the sensitivity to, and fear of, the potential negative consequences of anxiety-related symptoms and sensations. Respondents are asked to indicate, on a 5-point Likert-type scale (0 = “very little” to 4 = “very much”), the degree to which they are concerned about these possible negative consequences. The ASI-3 contains three empirically-established subscales relating to fears of social concerns (e.g., “It is important for me not to appear nervous”), fears of physical symptoms (e.g., “It scares me when my heart beats rapidly”), and fears of cognitive dyscontrol (e.g., “It scares me when I am unable to keep my mind on a task”). The measure possesses excellent psychometric properties, performing well on various indices of reliability and validity (Taylor et al., 2007; Buckner et al., 2015). In this study, the physical and cognitive subscales were employed as primary predictor variables, and the social subscale was used as covariate in analyses. Internal consistency estimates for these subscales in the current study were good to excellent (Cronbach's α 's = range of .88 – .90).

Barriers to Cessation Scale (BCS; Macnee & Talsma, 1995)—The BCS assesses perceived barriers, or specific stressors, associated with smoking cessation (e.g., “Having strong feelings such as anger, or feeling upset when you are with other people”). The BCS is a 19-item measure on which respondents indicate, on a 4-point Likert-type scale (0 = “not a barrier” to 3 = “large barrier”), the extent to which they identify with each of the identified perceived barriers to cessation. Researchers report good internal consistency regarding the total score, and good content and predictive validity of the measure (Garey et al., 2017). The BCS has three subscales: addictive barriers (“Withdrawal symptoms” and “Feeling lost without cigarettes”), external barriers (“No encouragement or help from friends” and “Seeing things or people which remind you of smoking”), and internal barriers (“Feeling less in control of your moods” and “Having strong feeling such as anger, or feeling upset when you are with other people”). In this study, the BCS total score was utilized as an outcome measure. The BCS total score demonstrated high internal consistency (Cronbach's $\alpha = .91$).

Smoking Consequences Questionnaire (SCQ; Brandon & Baker, 1991)—The SCQ is a 50-item self-report measure that assesses tobacco use outcome expectancies believed to underlie smoking motivation on a Likert-type scale, ranging from 0 (“completely unlikely”) to 9 (“completely likely”). The measure consists of four key factors: Negative

Reinforcement/Negative Affect Reduction (NR; 12 items; e.g., “Smoking helps me deal with depression”), Negative Consequences (NC; 18 items; e.g., “My throat burns after smoking”), Positive Reinforcement/Sensory Satisfaction (PR; 15 items; e.g., “I will enjoy the flavor of a cigarette”), and Appetite-Weight Control (AW; 5 items; e.g., “Smoking helps me control my weight”). In this study, the Negative Reinforcement/Negative Affect Reduction subscale was used as an outcome measure (Cronbach’s $\alpha = 0.91$). This study focused specifically on negative affect-based smoking expectancies, given theoretical models linking AS to emotional regulatory processes of smoking (Zvolensky & Bernstein, 2005)

Avoidance and Inflexibility Scale (AIS; Gifford & Lillis, 2009)—The AIS is a 13-item self-report measure of smoking-specific experiential avoidance. Respondents rate how they respond to difficult thoughts that encourage smoking (e.g., “I need a cigarette”), difficult feelings that encourage smoking (e.g., stress, fatigue, boredom), and bodily sensations that encourage smoking (e.g., “physical cravings or withdrawal symptoms”). Items are rated on a 5-point Likert-type scale (1 = “Not at all” to 5 = “Very much”), with higher scores reflecting greater levels of smoking-specific experiential avoidance (possible range 13–65). The AIS has displayed good reliability and validity in past work (Farris et al., 2015). In the present study, the AIS total score was used as an outcome measure (Cronbach’s $\alpha = .90$).

Analytic Strategy

First, a series of zero-order correlations were conducted to examine associations between studied variables. Then, to test the main and interactive effects of AS-physical and -cognitive concerns on the outcome variables, a series of regressions were conducted. Specifically, three regression analyses were conducted. In the first step of each model, gender, cigarette dependence, alcohol problems, tobacco-related medical illness, current Axis I disorder, and AS-social concerns were entered as covariates. Next, AS-physical and -cognitive concerns were entered (second step). Finally, the interaction term between AS-physical and -cognitive concerns was entered at the third step. Three separate GLM models were conducted with (1) perceived barriers to smoking cessation, (2) smoking-related negative reinforcement expectancies, and (3) smoking-related avoidance and inflexibility. Continuous variables were grand mean centered (Hofmann & Gavin, 1998). Finally, post-hoc analyses were completed using the PROCESS macro (Hayes & Preacher, 2014). These tests included: (1) simple slope analyses of significant interaction effects to illustrate the predicted value of criterion variables across the levels of AS-physical (1 *SD* below/above the mean; Holmbeck, 2002), and (2) examination of significance transition points for AS-physical using the Johnson-Neyman technique (Bauer & Curran, 2005). This latter approach indicates the precise range of values on a continuous moderator variable within which the simple regression slope for the focal predictor (i.e., regression of *x* on *y*) is significantly different from zero (Preacher, Curran, & Bauer, 2006).

Results

Descriptive Data and Zero-order Associations

Participants included 470 adults who smoke (47.8% female; $M_{age} = 37.2$, $SD = 13.5$), who participated in a multi-site randomized controlled clinical trial examining the efficacy of two smoking cessation interventions. In terms of ethnic background, 85.7% of participants identified as Caucasian, 8.3% identified as African American, 2.5% identified as Hispanic, 0.9% identified as Asian, and 2.5% identified as “other.” Participants reported smoking an average of 16.6 cigarettes per day ($SD = 9.9$), smoking their first cigarette at 14.8 years of age ($SD = 3.4$), and initiating regular (daily) smoking at 17.4 years of age ($SD = 3.7$). The average score on the Fagerstrom Test for Cigarette Dependence was 5.1 ($SD = 2.3$), indicating moderate levels of tobacco dependence (Heatherton et al., 1991; Fagerström et al., 2012). As determined by the baseline Structured Clinical Interview for DSM-IV Axis I Disorders-Non-Patient Version (SCID-I/NP), 45.0% of the sample met criteria for current (past year) Axis I psychopathology. Among participants with current psychopathology, the average number of diagnoses per participant was 1.4 ($SD = .49$).

Descriptive data and correlations of the present study variables are presented in Table 1. AS-cognitive and AS-physical were significantly correlated with each of the dependent measures (see Table 1). AS-cognitive and AS-physical also were positively correlated with one another ($r = .62$, $p < .01$; 53% shared variance).

Primary Analyses

The covariates entered at the first step accounted for a significant amount of variance in relation to perceived barriers to cessation ($R^2 = .20$, $F(6, 463) = 16.1$, $p < .001$); gender, cigarette dependence, and AS-social were significant predictors (see Table 2). In step two, neither AS-cognitive nor AS-physical accounted for a significant amount of variance. The interaction term between AS-cognitive and AS-physical was significant ($b = -0.05$, $SE = 0.02$, $p = 0.014$ see Table 2). Simple slope analyses revealed that AS-cognitive was related to perceived barriers at *lower* (but not higher) levels of AS-physical ($b = .19$, $SE = .10$, $p = .041$; see Figure 1). The Johnson-Neyman test revealed a significance transition point for AS-physical that was at the score of 5 (65.8% of observations were below this value and the effect of the focal predictor was significant at these values; Figure 1).

The covariates entered at the first step accounted for a significant amount of variance in negative affect reduction smoking expectancies ($R^2 = .23$, $F(6, 463) = 21.1$, $p < .001$); gender, cigarette dependence, alcohol problem, tobacco-related medical illness, current Axis I disorder and AS-social were significant predictors (see Table 2). At the second step, AS-cognitive and AS-physical were not significant predictors. The interaction term was significant ($b = -0.01$, $SE = 0.00$, $p = 0.032$; see Table 2). Simple slope analyses revealed that AS-cognitive was related to greater negative affect reduction smoking expectancies among individuals with *lower* (but not higher) levels of AS-physical ($b = .09$, $SE = .03$, $p = .033$; see Figure 1). The Johnson-Neyman results revealed that the significance transition point for AS-physical was 5 (65.8% of observations were below this value and the effect of the focal predictor was significant at these values; Figure 1).

The covariates entered at the first step accounted for a significant amount of variance in smoking-related avoidance and inflexibility ($R^2 = .20$, $F(6, 463) = 19.1$, $p < .001$); gender, cigarette dependence, tobacco-related medical illness, and AS-social were significant predictors (see Table 2). At the second step, neither AS-cognitive nor AS-physical were significant predictors. The interaction term was significant ($b = -0.06$, $SE = 0.02$, $p = 0.012$; see Table 2). Simple slope analyses revealed that AS-cognitive was related to greater smoking-related avoidance and inflexibility among individuals with *lower* (but not higher) levels of AS-physical ($b = .3$, $SE = .1$, $p = .014$; see Figure 1). The Johnson-Neyman results revealed that the significance transition point for AS-physical was 5 (65.8% of observations were above this value and the effect of the focal predictor was significant at these values; Figure 1).

Analyses were run with and without AS-social concerns included as a covariate. The pattern of findings remained consistent in both sets of analyses. The pattern of results also remained the same across the two treatment sites. Moreover, the test of three-way interaction with treatment site as the moderator of the examined interaction was not significant. These results can be obtained by contacting the first author and will be provided upon request.

Discussion

The present investigation sought to examine the interactive effects of AS-physical and -cognitive concerns in relation to smoking-oriented cognitions of (1) perceived barriers to smoking cessation, (2) smoking-related negative reinforcement expectancies, and (3) smoking-related avoidance and inflexibility. Consistent with study hypotheses, results indicated a significant interaction between the AS-physical and -cognitive concerns subscales regarding the studied smoking-oriented cognitions. Namely, the association between AS-cognitive concerns and the studied smoking-based cognitions were stronger among *lower* levels of AS-physical concerns (but not higher physical concerns). The observed effects were evident after accounting for gender, cigarette dependence, alcohol problems, tobacco-related medical illness, current Axis 1 disorder, and AS-social concerns. Further, the same patterns of association were observed across all three smoking-oriented cognitions examined in this study.

Consistent with past work focused on the interactive effects of AS subfactors (Capron et al., 2012b; Capron et al., 2013), AS-cognitive concerns were positively associated with the studied outcomes among adults who smoke and are characterized by low levels of AS-physical concerns. It is possible that when AS-physical concerns are low, smokers may be less fearful of, and/or experience lesser provocation by aversive visceral sensations following smoking a cigarette (e.g. heart palpitation; Fink et al., 2013), and therefore, the role of the fear of cognitive dyscontrol on these smoking processes is intensified (Fink et al., 2013). That is, tolerance of aversive somatic sensations related to tobacco smoking could serve as a dynamic context in which the concomitant cognitive concerns may impact perceived barriers to smoking cessation, smoking-related negative reinforcement expectancies, and smoking-related avoidance and inflexibility. In addition, the subgroup of adults who smoke with low levels of AS-physical concerns and high levels of AS-cognitive concerns demonstrated the highest levels of maladaptive smoking-related cognitive

processes (Figure 1). A growing body of research suggests that attentional disruption occurs during periods of nicotine deprivation (McClernon & Kollins, 2008; Harrison et al., 2009). Thus, this subgroup of adults who smoke with low levels of physical concerns who are elevated on cognitive concerns (e.g., “It scares me when I am unable to keep my mind on a task”) may be especially fearful of abstinence, and/or motivated to resume smoking during episodes of cessation, to avoid difficulties with concentration and attention.

At higher levels of AS-physical concerns, however, this same pattern is not evident. Here, it may be that when adults who smoke experience pervasive worry about the nature and meaning of physical symptoms, concerns about cognitive dyscontrol become a less salient predictor of smoking-related cognitions. That is, high levels of AS-physical concerns might “trump” AS-cognitive-concerns. These data collectively highlight that emotion risk candidates interplay in complex ways in to enhance maladaptive cognitive characteristics of smoking.

There are several limitations to the current study. First, given the cross-sectional nature of these data, the directionality of the observed effects are not known. Second, our sample consisted of community-recruited, treatment-seeking adults who smoke daily with moderate levels of tobacco dependence. Third, the sample was largely comprised of a relatively homogenous group of treatment-seeking adults who smoke, and therefore, it will be important for future studies to recruit a more ethnically/racially diverse sample. Lastly, this study is based on secondary analyses of baseline data for a subset of the sample, which should be considered when interpreting the results.

The current findings suggest there is clinical utility in specialized interventions addressing specific facets of AS for different sub-groups of adults who smoke (i.e. individuals with different AS profiles) to promote more adaptive cognition and perceptions about quitting (Bierut et al., 2014). For example, adults who smoke and are characterized by low levels of AS-physical and high levels of AS-cognitive concerns may require targeted strategies to facilitate tolerance and acceptance of exaggerated fears related to cognitive dyscontrol (Schmidt et al., 2014). Here, existing AS reduction programs for smoking cessation, albeit still in developmental phases, have provided evidence of the feasibility and merit of incorporating tailored cognitive-behavioral skills and exercise-based modalities into smoking cessation programs (Zvolensky et al., 2008; Smits et al., 2016). Future work may benefit from exploring how these therapeutic tactics can modify the facets of AS (independently and in combination) to improve smoking-oriented cognitions, such as motives and expectancies for smoking and self-efficacy for quitting as a way to facilitate improved cessation outcomes.

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Perceived Barriers to Cessation

Negative Reinforcement Smoking Expectancies

Smoking-Related Avoidance and Inflexibility

Figure 1. Plots of simple slope analyses (upper charts) and significance transition points in AS-physical for the effects of AS-cognitive (lower charts) in terms of smoking-related cognitions. LLCI = lower level confidence intervals; ULCI = upper level confidence intervals.

Table 1

Descriptive statistics and bivariate correlations among variables.

Variable	Mean/ <i>n</i> (SD/%)	1	2	3	4	5	6	7	8	9	10	11
1. Gender (% Female)	315 (87.5%)	1										
2. FTND	5.19 (2.29)	-.01	1									
3. AUDIT	6.20 (6.00)	.24**	0.08	1								
4. Tob-Med	0.37 (0.62)	-.09	-.15**	.12**	1							
5. Axis I	212 (45.0%)	0.01	-.02	0.08	-.12**	1						
6. AS-social	7.33 (5.23)	0.04	.09*	.29**	.17**	-.02	1					
7. AS-cognitive	3.47 (4.55)	.12**	.12**	.32**	.16**	-.03	.64**	1				
8. AS-physical	4.83 (4.86)	.10*	.12**	.25**	.11*	.13**	.57**	.63**	1			
9. BCS-total	24.79 (11.18)	.22**	.18**	.21**	0.09	-.03	.34**	.28**	.24**	1		
10. SCQ-nr	5.62 (1.82)	.19**	.19**	.23**	.17**	-.09*	.29**	.27**	.20**	.52**	1	
11. AIS	44.97 (10.72)	.21**	.32**	.22**	0.01	0.08	.23**	.25**	.24**	.54**	.47**	1

Note. Gender (0 = male; 1 = female); FTCD = Fagerstrom Test for Cigarette Dependence; AUDIT = Alcohol Use Disorders Identification Test; Axis I = Primary Axis I Diagnosis at Baseline (0 = no dx; 1 = diagnosis present); Tob-med = Tobacco-Related Medical Illnesses; AS-Social = Anxiety Sensitivity Social Subscale; AS-Cognitive = Anxiety Sensitivity Cognitive Subscale; AS-Physical = Anxiety Sensitivity Physical Subscale; BCS total = Barriers of Cessation Scale Total Score; SCQ-nr = Smoking Consequences Questionnaire Negative Reinforcement Subscale; AIS = Avoidance and Inflexibility Scale Total Score. Numbers across header correspond with variables numbered 1–11.

* $p < .05$;

** $p < .01$.

Table 2

Main and interactive effects of AS-cognitive and AS-physical for perceived barriers to cessation, negative affect reduction smoking expectancies, and smoking-related avoidance and inflexibility.

<i>Perceived Barriers to Cessation</i>						
	<i>b</i>	<i>SE</i>	<i>B</i>	<i>t</i>	<i>p</i>	<i>R</i> ² Change
Step 1						
Gender	4.67	0.94	0.22	5.00	<0.001	
FTCD	1.02	0.21	0.22	4.94	<0.001	
AUDIT	0.15	0.08	0.08	1.79	0.072	
Tob-Med	0.39	0.77	0.02	0.51	0.611	
Axis I	1.43	1.00	0.07	1.43	0.154	
AS-social	0.57	0.10	0.26	5.85	<0.001	.20***
Step 2						
AS-cognitive	0.14	0.16	0.05	0.82	0.413	
AS-physical	0.11	0.15	0.05	0.76	0.455	.00
Interaction						
AS-cognitive * AS-physical	-0.05	0.02	-0.25	-2.37	0.014	.01*
<i>Negative Reinforcement Smoking Expectancies</i>						
	<i>b</i>	<i>SE</i>	<i>B</i>	<i>t</i>	<i>p</i>	<i>R</i> ² Change
Step 1						
Gender	0.65	0.14	0.21	4.75	<0.001	
FTCD	0.11	0.03	0.16	3.60	<0.001	
AUDIT	0.04	0.01	0.14	3.17	<0.001	
Tob-Med	-0.24	0.11	-0.09	-2.17	0.032	
Axis I	0.30	0.15	0.09	2.04	0.044	
AS-social	0.08	0.01	0.27	5.97	<0.001	.23***
Step 2						
AS-cognitive	0.03	0.02	0.09	1.43	0.15	
AS-physical	-0.00	0.02	-0.01	-0.09	0.93	.01

<i>Perceived Barriers to Cessation</i>						
<u>Interaction</u>	<i>b</i>	<i>SE</i>	<i>B</i>	<i>t</i>	<i>p</i>	<i>R</i> ² Change
AS-cognitive * AS-physical	−0.01	0.00	−0.23	−2.08	0.032	.01**

<i>Smoking-Related Avoidance and Inflexibility</i>						
<u>Step 1</u>	<i>b</i>	<i>SE</i>	<i>B</i>	<i>t</i>	<i>p</i>	<i>R</i> ² Change
Gender	3.84	0.86	0.20	4.49	<0.001	
FTCD	1.34	0.19	0.31	7.09	<0.001	
AUDIT	0.08	0.08	0.05	1.08	0.285	
Tob-Med	1.64	0.71	0.10	2.32	0.022	
Axis I	1.70	0.91	0.09	1.87	0.062	
AS-social	0.33	0.09	0.17	3.69	<0.001	.20***

<u>Step 2</u>	<i>b</i>	<i>SE</i>	<i>B</i>	<i>t</i>	<i>p</i>	<i>R</i> ² Change
AS-cognitive	0.13	0.15	0.06	0.87	0.382	
AS-physical	0.15	0.14	0.07	1.11	0.271	.01

<u>Interaction</u>	<i>b</i>	<i>SE</i>	<i>B</i>	<i>t</i>	<i>p</i>	<i>R</i> ² Change
AS-cognitive * AS-physical	−0.06	0.02	−0.28	−2.65	0.012	.01**

Note. Gender (0 = male; 1 = female); FTCD = Fagerstrom Test for Cigarette Dependence; AUDIT = Alcohol Use Disorders Identification Test; Axis I = Primary Axis I Diagnosis at Baseline (0 = no dx; 1 = diagnosis present); Tob-med = Tobacco-Related Medical Illnesses; AS-Social = Anxiety Sensitivity Social Subscale; AS-Cognitive = Anxiety Sensitivity Cognitive Subscale; AS-Physical = Anxiety Sensitivity Physical Subscale; BCS total = Barriers of Cessation Scale Total Score; SCQ-nr = Smoking Consequences Questionnaire Negative Reinforcement/Negative Affect Reduction Subscale; AIS = Avoidance and Inflexibility Scale Total Score.

* $p < .05$;

** $p < .01$;

*** $p < .001$