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Smoking and Posttraumatic Stress Symptoms among Adolescents: Does Anxiety Sensitivity Matter?

Matthew T. Feldner^{1*}, Ellen W. Leen-Feldner¹, Casey Trainor¹, Leslie Blanchard¹, and Candice M. Monson²

¹University of Arkansas

²Veterans Affairs National Center for PTSD, Women's Health Sciences Division

Abstract

The present study examined the hypothesized moderating role of anxiety sensitivity (AS) in the relationship between lifetime smoking history and posttraumatic stress symptoms among 64 traumatic event-exposed adolescents. As predicted, the relationship between smoking status and posttraumatic stress symptom levels was moderated by AS. Specific facets of AS also were examined. Disease concerns, but not unsteady, mental illness, or social concerns, moderated the association between smoking and symptom level. These findings are generally consistent with findings from adult samples, but importantly extend this area of research to another phase of the lifespan.

Keywords

smoking; posttraumatic stress; adolescents; anxiety sensitivity

Adolescents are frequently exposed to potentially traumatic events, or events that are perceived as a threat to oneself and elicit fear, helplessness, or horror [American Psychiatric Association (APA), 1994]. In a recent study of 1,420 adolescents, over 68% had been exposed to at least one traumatic event by age 16 (Copeland, Keeler, Angold, & Costello, 2007). Traumatic event exposure has been linked to both symptoms of posttraumatic stress disorder (Copeland et al., 2007) and smoking (Feldner, Babson, & Zvolensky, 2007) among adolescents. For instance, among adolescents between 12 and 17 years old ($n = 4,023$), exposure to physical assault and witnessing violence were both associated with a two-fold increase in the likelihood of current regular smoking when compared with adolescents without a history of trauma (Acierno et al., 2000). Moreover, this relation remained even after controlling for race and familial substance use, two factors strongly associated with smoking in adolescents. Sexual assault also was associated with a comparable increase in likelihood of smoking, although the relation was reduced to nonsignificance among boys (who reported low rates of sexual assault) after including the covariates. Similarly, in a separate study (Kaplan et al., 1998), physically-abused adolescents ($n = 99$) were approximately three times more likely than their non-abused counterparts ($n = 99$) to report both lifetime and current smoking. This strong association

*Corresponding author, University of Arkansas, Department of Psychology, 216 Memorial Hall, Fayetteville, AR 72701, Phone: 479-575-4256, Fax: 479-575-3219, E-mail: mfeldne@uark.edu.

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remained after controlling for other factors associated with increased smoking (e.g., one biological parent in the home, female gender, increased age).

Smoking among adolescents also is positively associated with the degree to which adolescents react symptomatically to a traumatic event (Lipschitz, Rasmussen, Anyan, Cromwell, & Southwick, 2000). For example, among 104 adolescent inner-city girls, a significantly greater proportion of girls with posttraumatic stress disorder (PTSD) compared with traumatic event-exposed girls without PTSD smoked (86% and 31%, respectively; Lipschitz et al., 2003). Also, posttraumatic stress symptom levels were significantly positively associated with smoking levels. Collectively, (1) adolescents are frequently exposed to traumatic events, (2) such exposure is related to elevated smoking rates, and (3) relatively greater posttraumatic stress symptom levels are related to an increased likelihood of smoking. An important next step is to understand factors that may affect the relation between posttraumatic stress symptom level and smoking among traumatic event-exposed adolescents (e.g., moderators of the association). One individual difference factor that likely affects this association is anxiety sensitivity (AS).

Anxiety sensitivity is a trait-like fear of anxiety-related sensations (Reiss & McNally, 1985). To illustrate, an individual who fears that stomach discomfort associated with anxiety is indicative of serious illness could be described as being high in AS. Factor analytic research with youth has suggested that within the global construct of AS, there are four lower order factors: Disease Concerns, Unsteady Concerns, Mental Illness Concerns, and Social Concerns (Silverman, Goedhart, Barrett, & Turner, 2003). Research with adults has suggested that AS affects the relationship between smoking and posttraumatic stress symptom levels (Feldner et al., 2008). Specifically, among 78 traumatic event-exposed adult (18 to 61 years old; $M = 24.38$; $SD = 10.51$) daily smokers, the interaction between AS and smoking level accounted for significant variance in posttraumatic stress symptom levels above and beyond the main effects of gender and number of traumatic event exposures. Individuals smoking relatively more frequently who also reported elevated AS endorsed the greatest symptom levels. More specifically, the global AS factor and the Physical Concerns and Mental Incapacitation Concerns, but not Social Concerns (factors identified on the adult Anxiety Sensitivity Index; Zinbarg, Barlow, & Brown, 1997), evidenced this moderating pattern (Feldner et al., 2008). These findings suggest that the interaction between elevated AS and smoking levels relate to relatively higher levels of posttraumatic stress symptoms among adults, but no research has been conducted to examine this pattern among adolescents.

Accordingly, the current study was developed as an initial cross sectional test of AS as a moderator of the smoking history – posttraumatic stress symptom level relation (which ultimately will require prospective examination). The global AS construct and the constituent lower-order facets were tested as moderators of the relation between smoking history and posttraumatic stress symptom levels among adolescents (aged 10 to 17 years). The first hypothesis tested was that adolescents with positive, as compared to negative, smoking histories would report greater posttraumatic stress symptom levels. We also predicted that the global AS construct as well as the disease, unsteady, and mental illness concerns factors would positively relate to posttraumatic stress symptom levels. Finally, it was expected that the relation between smoking history and symptom level would be moderated by general levels of AS and levels of disease, unsteady, and mental illness concerns. In terms of the moderating hypotheses, it was expected that adolescents with positive smoking histories who also reported relatively higher levels of AS would endorse higher symptom levels than adolescents without smoking histories and those with smoking histories and relatively lower levels of AS. Although it was not expected that AS Social Concerns would evidence main or interactive relations with posttraumatic stress (based on prior findings; Feldner et al., 2008), these relations were examined as such specificity tests are important in understanding interrelations among risk processes (Rutter, 1994).

Method

Participants

The sample consisted of 64 (40 females) adolescents ($M_{\text{age}} = 15$ years, 0 months; $SD = 2$ years, 4 months; range = 10 years, 6 months to 17 years, 11 months) who reported exposure to at least one *Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition* (DSM-IV; APA, 1994) defined traumatic event (see below for details). Participants were selected from a larger sample ($n = 225$) who were recruited via announcements and flyers placed throughout the local community. Education level was as follows: 7 (11%) participants completed 4th to 5th grade, 18 (28%) completed 6th to 7th grade, 18 (28%) completed 8th to 9th grade, and 21 (33%) had completed 10th to 11th grade. In regard to racial composition of the sample, 87% self-identified as Caucasian, 5% as Asian-American, and 8% as other.

The majority of participants ($n = 43$, 67%) reported exposure to 1 type of traumatic event; 16 participants (25%) reported exposure to 2 types and 5 (8%) endorsed exposure to 3 to 6 event types. In terms of traumatic event types endorsed, 28 (43%) participants were in a natural disaster, 27 (42%) witnessed a person die or get badly injured, 16 (25%) were badly injured, 9 (14%) were sexually assaulted, 7 (11%) were in an accident or fire, 5 (8%) were physically assaulted, 4 (6%) were robbed or attacked, and 1 (2%) endorsed another type of traumatic event. The average duration since the traumatic event rated as the most distressing was 36.10 ($SD = 38.45$) months. In terms of posttraumatic stress symptom levels, participants' scores on the Child PTSD Symptom Scale (Foa, Johnson, Feeny, & Treadwell, 2001) ranged from 0 to 32 ($M = 4.23$, $SD = 6.64$). Eight participants (12%) met diagnostic criteria for PTSD. In terms of smoking characteristics, 22 (34%) participants endorsed positive lifetime smoking histories. Among lifetime smokers, mean age of smoking initiation was 12.61 years ($SD = 2.72$) and they reported smoking an average of 4.70 ($SD = 13.51$) cigarettes per day during the last month. Also, 7 participants (11%) endorsed current daily smoking ($M_{\text{cigarettes per day}} = 15.66$, $SD = 22.07$).

Measures

Anxiety Disorders Interview Schedule for the Diagnostic and Statistical Manual – Fourth Edition: Child Version (ADIS-C)—The ADIS-C is a well-established semi-structured interview for children and adolescents used in the assessment of DSM-IV defined anxiety, mood, and externalizing disorders (Silverman & Albano, 1996). The ADIS-C was administered to index exposure to a DSM-IV-defined traumatic event (APA, 1994) and time since the event. Participants were asked about nine specific events (e.g., “Have you ever witnessed a serious natural disaster such as a tornado near your home?”), as well as any other upsetting events not explicitly listed in the interview. Reported event exposures were then probed to determine whether significant threat to self or others was perceived, as well as if a subjective reaction of intense fear, helplessness, or horror (e.g., “were you very afraid?”) was present during the event. Traumatic events were defined as events characterized by perceived threat and the presence of fear, helplessness, or horror (APA, 1994). Interviewers were trained via intensive didactic sessions, direct observation of ADIS-C administrations, and diagnostic comparison with doctoral-level administrators. Ongoing supervision (e.g., to resolve diagnostic questions) was provided throughout the study. Blind random reliability checks of 5% of audiotaped interview administrations yielded 100% diagnostic agreement.

Child PTSD Symptom Scale (CPSS)—Posttraumatic stress symptom level was measured using the 17-item CPSS (Foa et al., 2001). This scale indexes the presence and frequency of the 17 DSM-IV-defined PTSD symptoms in relation to the most distressing event reported during the ADIS-C interview. Respondents rate the frequency of symptoms such as “having bad dreams or nightmares” during the past two weeks on a scale of 0 (“not at all/only at one

time”) to 3 (“5 or more times a week/almost always”), yielding a range of 0 to 51. The CPSS has demonstrated adequate psychometric properties among youth (Foa et al., 2001). Consistent with past research (Foa et al., 2001), the CPSS was administered in interview format, which yielded good internal reliability (Cronbach’s Alpha = .85).

Childhood Anxiety Sensitivity Index (CASI)—The well-established 18-item CASI was developed to measure AS levels among children and adolescents (Silverman, Fleisig, Rabian, & Peterson, 1991). Participants rate perceptions of the aversive nature of anxiety symptoms on a three point scale (1 = “none,” 2 = “some,” 3 = “a lot”). The scale has demonstrated good psychometric properties (e.g., Cronbach’s alpha for the total scale = .87; test-retest reliability = .76) and satisfactory validity estimates (Silverman et al., 1991). A recent confirmatory factor analysis suggests the CASI is hierarchical in nature, with a general higher order factor and four lower order factors, all of which have satisfactory internal consistencies (Silverman et al., 2003): Disease Concerns (4 items, e.g., “When my stomach hurts, I worry that I might be really sick”); Unsteady Concerns (3 items, e.g., “It scares me when I have trouble getting my breath”); Mental Illness Concerns (3 items, e.g., “When I am afraid, I worry that I might be crazy”); and Concerns (3 items, e.g., “I don’t like to let my feelings show”). Internal consistency (Cronbach’s Alpha) for the CASI in the current sample was comparable to previous studies: Total Score = .84; Disease Concerns = .61; Unsteady Concerns = .71; Mental Illness Concerns = .56; and Social Concerns = .60.

Smoking History Questionnaire—A standardized questionnaire that measures key indices of smoking history as agreed upon by a National Cancer Institute consensus panel was employed to assess smoking characteristics. This measure indexes a variety of smoking-related variables, including smoking frequency and patterns of smoking, and has been used successfully with adolescents in past research (Horn et al., 1999). Consistent with prior research on smoking and posttraumatic stress among youth (e.g., Anda et al., 1999; Kaplan et al., 1998) and national surveys (e.g., Johnston, O’Malley, Bachman, & Schulenberg, 2004), the current study examined smoking histories, which were indexed via a question asking participants if they ever smoked. Participants indicating that they had smoked were coded as having a positive smoking history and those denying ever smoking were coded as having a negative smoking history.

Positive and Negative Affect Schedule for Children (PANAS-C)—The negative affect scale of the PANAS-C is a well-established measure, developed specifically for use with children and adolescents (Wilson, Gullone, & Moss, 1998), of the propensity to experience negative emotions, including anxiety and non-anxiety (e.g., sadness, irritability, and anger) states (Joiner, Catanzaro, & Laurent, 1996). For each of 15 descriptors on the PANAS-C, participants indicate on a 5-point Likert-type scale (1 = “very slightly” to 5 = “extremely”) the degree to which the descriptor typifies how they generally feel. The PANAS-C has been successfully employed in studies of posttraumatic stress among youth (Weems et al., 2007). The PANAS-C has demonstrated good internal consistency as well as adequate discriminant and convergent validity among these populations (Joiner et al., 1996). The internal consistency for the negative affect scale in the current sample was good (Cronbach’s α = .91).

Procedure

The current study was part of a larger study of correlates of anxiety among adolescents, which was conducted at the University of Arkansas; all procedures were approved by the University Institutional Review Board. Adolescents responding to community-based advertisements (e.g., information booths in public market places, flyers) were scheduled for individual laboratory assessments. Upon arrival, written informed adolescent assent and parental guardian consent was obtained. The ADIS-C was then administered. Next, participants completed a battery of

assessments, including those described in the current report. The entire battery was randomly ordered to control for potential order effects. Upon completion of the assessment, participants were debriefed and compensated \$40.

Data Analysis

To examine hypothesis one, a between group analysis of variance compared youth with, relative to without, smoking histories in terms of posttraumatic stress symptom levels. Then, zero order correlations were computed to examine the relation between posttraumatic stress symptom levels and AS (hypothesis two). Third, hierarchical multiple regression analyses were performed to test the incremental (or relative) predictive validity of the AS (i.e., total and factor scores on the CASI) $\times$ smoking history interaction term. The criterion measure was CPSS-measured continuous levels of posttraumatic stress symptoms. First, correlations were examined between the criterion variable (i.e., symptom levels) and variables that have been theoretically or empirically related to this outcome. Age, gender, alcohol use history, and negative affectivity were examined. Consistent with prior research (Feldner, Lewis, LeenFeldner, Schnurr, & Zvolensky, 2006), variables significantly correlated with symptom severity were entered at step 1 of the regression to control for variance in symptom severity associated with the predictor. The main effects of AS and smoking history were entered at step 2 and the term for the AS and smoking history interaction was entered at step 3. Main effect variables were mean-centered prior to computing the interaction term (Aiken & West, 1991). This model tests hypothesis three regarding whether AS moderates the relation between smoking history and posttraumatic stress symptom levels (Baron & Kenny, 1986) and ensures any observed effects for the interaction term are unique and cannot be attributed to shared variance with the other factors in steps 1 or 2 (Cohen & Cohen, 1983). Recommended procedures for probing significant interactions (Holmbeck, 2002) were employed and effect size was indexed by squared semi-partial correlations (sr^2).

Results

Zero-Order Correlations

First, associations among theoretically and empirically-relevant factors were examined. Posttraumatic stress symptom level was not related to age ($r = .19$, ns) and did not differ as a function of gender ($t = 0.83$, ns) or alcohol use history ($t = 1.93$, ns). However, PANAS-C negative affectivity scores were significantly related to symptom levels ($r = .24$, $p < .05$). Accordingly, PANAS-C scores were included at step 1 of each regression model.

Consistent with hypothesis one, adolescents with positive smoking histories endorsed significantly higher symptom levels than those without smoking histories [$M = 7.54$ ($SD = 8.53$) and $M = 2.50$ ($SD = 4.65$), respectively; $t = 9.42$, $p < .01$]. In support of hypothesis two, CASI total ($r = .59$, $p < .001$), Disease Concerns ($r = .54$, $p < .001$), Unsteady Concerns ($r = .40$, $p < .01$), and Mental Illness Concerns ($r = .69$, $p < .001$) scores were all positively related to posttraumatic stress symptom levels. Also as predicted, CASI Social Concerns scores were not significantly associated with symptom levels ($r = .20$, ns). Youth with, versus without, positive smoking histories reported significantly higher AS-Disease Concerns [$M = 6.13$ ($SD = 1.90$) versus $M = 5.14$ ($SD = 1.42$), respectively] and AS-Social Concerns [$M = 6.95$ ($SD = 1.58$) versus $M = 6.14$ ($SD = 1.42$), respectively; $t = 5.53$ and 4.33 , respectively; p 's $< .05$].

Primary Analyses

See Table 1 for an overview of the hierarchical regression analyses examining AS as a moderator of the smoking history – posttraumatic stress level relation (hypothesis three). For the analysis using CASI total scores, the predictors together explained 45% (adjusted $R^2 = .41$) of the variance in posttraumatic stress symptom level, $F(4, 59) = 12.23$, $p < .001$. At step

1 of the model, PANAS-C Negative Affectivity scores were significantly positively associated with symptom levels, accounting for 5% of unique variance. At step 2, CASI total scores significantly accounted for an additional 29% of unique variance and smoking history significantly accounted for another 8% of unique variance, resulting in the entire model at step 2 accounting for 41% of overall variance (adjusted $R^2 = .38$). At step 3, the CASI total score by smoking history accounted for an additional 6% of unique variance in symptom level. Analysis of the interaction suggested that smoking was more strongly related to symptom levels among adolescents with relatively higher CASI total scores ($\beta = .43, p < .01$) compared to those endorsing relatively lower CASI total scores ($\beta = .00, p > .05$).

Regressions were then conducted utilizing CASI factor scores (see Table 1). The first step of each model was comparable to that described for the regression utilizing the CASI total score (i.e., PANAS-C Negative Affectivity scores accounted for 5% of unique variance in symptom levels). In analyses with the Disease Concerns factor, the predictors collectively accounted for a total of 39% (adjusted $R^2 = .35$) of variance in symptom levels, $F(4, 59) = 9.49, p < .001$. Factors included at step 2, in total, accounted for 34% (adjusted $R^2 = .31$) of overall variance, with both CASI disease concerns and smoking history significantly accounting for unique variance (21% and 6%, respectively). At step 3, the CASI Disease Concerns by smoking history interaction also accounted for a significant amount of unique variance (6%). Analysis of the interaction suggested that smoking was more strongly associated with posttraumatic stress among youth relatively higher in CASI Disease Concerns ($\beta = .41, p < .01$) than among youth relatively lower in Disease Concerns ($\beta = .00, p > .05$).

In terms of CASI Unsteady Concerns, the entire model accounted for 29% (adjusted $R^2 = .24$) of variance in symptom levels, $F(4, 59) = 6.19, p < .001$. At step 2 of the model, both Unsteady Concerns scores and smoking history accounted for significant amounts of unique variance (12% and 11%, respectively), resulting in 27% of overall variance (adjusted $R^2 = .23$) accounted for by all factors included at step 2 of the model. The Unsteady Concerns by smoking history interaction term was not significantly associated with symptom levels.

The model examining CASI Mental Illness Concerns significantly accounted for a total of 53% (adjusted $R^2 = .50$) of variance in symptom levels, $F(4, 59) = 16.82, p < .001$. Factors included at step 2 of the model collectively accounted for 52% (adjusted $R^2 = .50$) of overall variance, with both CASI Mental Illness Concerns scores and smoking history accounting for a significant amount of variance (42% and 8%, respectively). The Mental Illness Concerns score by smoking history interaction term was not significantly related to symptom levels.

Finally, the model that included CASI Social Concerns scores significantly accounted for 17% (adjusted $R^2 = .12$) of overall variance in symptom levels, $F(4, 59) = 3.16, p < .05$. At step 2 of the model, only smoking history was significantly related to symptom level, accounting for 9% of unique variance, increasing the model's explanatory ability to 17% (adjusted $R^2 = .13$) of overall variance by step 2. The Social Concerns factor score by smoking history interaction term was not significantly related to posttraumatic stress symptom level.

Discussion

The current study contributes to the growing literature on the relationship between smoking and posttraumatic stress symptoms among youth, and uniquely examined AS as a moderator of this association. Consistent with prediction, traumatic event-exposed adolescents with positive smoking histories reported higher levels of posttraumatic stress symptoms and this relationship was moderated by AS. In terms of specific facets of the global AS construct, as predicted, the Disease Concerns factor moderated the relation between smoking history and posttraumatic stress symptom level. In both instances, smoking was more strongly associated

with posttraumatic stress symptom levels among youth relatively higher in AS. No other AS factor demonstrated this moderating effect. These findings extend prior research with adults (Feldner et al., 2008) and are important to understanding smoking – posttraumatic stress linkages among youth. Indeed, it cannot be assumed that research with adults can be generalized to adolescence (Cicchetti & Rogosch, 2002). Adolescence is a “critical period” characterized by relatively unique biopsychosocial transitions that are relevant to anxiety-related psychopathology (Leen-Feldner, Reardon, Hayward, & Smith, 2008), making it an important epoch during which to study the correlates and consequences of traumatic event exposure.

The current findings provide support for the moderating role of AS in the smoking – posttraumatic stress relation. Thus, careful consideration of possible explanations for this pattern appears warranted. Consistent with a predisposition model of vulnerability (Clark, Watson, & Mineka, 1994), smoking during critical periods of development such as childhood and adolescence, when smoking frequently begins (Breslau, Johnson, Hiripi, & Kessler, 2001), may alter neurobiological functioning (possibly reflected in elevated AS) such that posttraumatic stress symptoms do not remit subsequent to traumatic event exposure (Rasmusson, Picciotto, & Krishnan-Sarin, 2006). Alternatively, adolescents likely are familiar with the well-publicized negative health consequences of smoking (Lando et al., 2005). Therefore, adolescents with positive smoking histories who fear that anxiety-related physical sensations are indicative of disease (i.e., high in Disease Concerns) may experience greater anxiety than never smokers or persons with relatively lower fear of anxiety-related physical sensations. This relatively elevated basal level of anxiety may function to maintain posttraumatic stress. Importantly, the current data do not permit conclusions regarding the directionality of the posttraumatic stress – smoking association, and current theory and research suggest it may be bi-directional (Feldner et al., 2007; Rasmusson et al., 2006). Nonetheless, the current results suggest future research on the role of AS will be helpful in understanding the processes underlying the association, which will lead to more a sophisticated understanding of this relation. Along these lines, future research in this area may extend the current study by approaching the AS construct from the perspective of recent work (e.g., Bernstein et al., 2006) suggesting that the latent structure of AS may be taxonic, as opposed to the current approach that operationalized AS as a dimensional construct.

Unsteadiness Concerns, conceptualized as physically-oriented concerns (e.g., concerns about fainting and getting one’s breath; Silverman et al., 2003), did not evidence this moderating relation. Similarly in contrast to prediction, Mental Illness Concerns did not moderate the smoking - posttraumatic stress relation. Smoking-related factors that may maintain posttraumatic stress as a function of AS level may differ between daily smokers as studied previously (Feldner et al., 2008) and the current youth with only positive histories. For instance, daily smokers are likely to experience nicotine withdrawal quickly after the last cigarette smoked, and this is characterized, in part, by sensations such as difficulty concentrating (McCarthy, Piasecki, Fiore, & Baker, 2006). Daily smokers high in Mental Illness Concerns may experience relatively elevated basal anxiety levels due to fear of these frequently-encountered withdrawal symptoms, which may interfere with recovery from traumatic event exposure. Similarly, adolescents with positive smoking histories may not experience the immediate physical consequences of smoking (e.g., trouble breathing) until daily smoking patterns are established. Thus, mental illness and unsteady concerns may affect the smoking – posttraumatic stress relation among daily smokers experiencing nicotine withdrawal, but not among persons with only positive smoking histories. Importantly, this theoretical speculation requires empirical testing. Studies should compare the moderating role of AS between daily smokers and adolescents with positive smoking histories who are not daily smokers. Prospective designs also will be critical. For example, examining the interactive role of pretraumatic event AS and smoking among youth in predicting PTSD will be necessary to demonstrate that these two factors are important in recovery from traumatic event exposure.

Results also suggested that both relatively elevated AS and positive smoking histories are individually and uniquely related to greater posttraumatic stress symptom levels. This pattern is consistent with adult-focused research suggesting these factors may maintain posttraumatic stress symptoms (Feldner, Zvolensky, Schmidt, & Smith, in press; Koenen et al., 2005; van der Velden, Kleber, & Koenen, in press). The current study also uniquely extends this work to examination of the specific facets of AS. Results suggest posttraumatic stress symptom levels are positively associated with global levels of AS, particularly physically and mentally-oriented concerns, but not socially-oriented concerns. This pattern is generally consistent with research among adults (Feldner et al., 2006; Lang, Kennedy, & Stein, 2002).

Multiple limitations of the current study require consideration. First, reliance on self-report measures increased susceptibility to response bias. Future studies should incorporate biochemical verification of smoking histories (e.g., cotinine analysis) and multimodal assessment of posttraumatic stress symptoms (e.g., laboratory assessment of responding to traumatic event cues; see Orr & Roth, 2000). Second, the sample was comprised primarily of Caucasians and the mean age was 15 years old. Thus, the current findings need to be extended to more heterogeneous and younger samples, prior to generalizing these results to the period of adolescence broadly defined. Third, participants were not necessarily current smokers. While this strategy was helpful at this early stage in research, and corresponds with other studies of smoking and posttraumatic stress among youth (e.g., Anda et al., 1999; Kaplan et al., 1998), it will be important to examine the factors studied herein among current smokers. Relatedly, while there was a broad range of posttraumatic stress symptom levels, the mean level of symptoms was relatively low. Thus, the clinical significance of the magnitude of associations observed requires additional investigation. Also, the most frequent traumatic event type reported was experiencing a natural disaster, with relatively low frequencies of other event types (e.g., physical assault). Future research needs to examine if the current findings generalize to current and former regular smokers, youth with higher posttraumatic stress symptom levels, and youth exposed to different traumatic event types. Finally, the cross-sectional design precludes conclusions about the interplay between AS and smoking in terms of recovery from traumatic event exposure, which would require longitudinal methods.

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Table 1
Individual Variable Contributions in Hierarchical Regression Models Examining Posttraumatic Stress Symptom Levels

	CASI Total Score			Disease Concerns			Unsteady Concerns			Mental Illness Concerns			Social Concerns		
	ΔR^2	β	sr^2	ΔR^2	β	sr^2	ΔR^2	β	sr^2	ΔR^2	β	sr^2	ΔR^2	β	sr^2
Step 1	.05 [*]	.24 [*]	.05	.05 [*]	.24 [*]	.05	.05 [*]	.24 [*]	.05	.05 [*]	.24 [*]	.05	.05 [*]	.24 [*]	.05
Negative Affectivity	.35 ^{***}			.28 ^{***}			.21 ^{***}			.46 ^{***}			.11 [*]		
Step 2															
Negative Affectivity		-.11 ^{***}	.01		-.04 [*]	.00		.07 [*]	.00		-.01 ^{***}	.00		.17	.03
AS		.59 ^{***}	.29		.50 ^{***}	.21		.34 ^{**}	.12		.65 ^{***}	.42		.09	.01
Smoking History		.24 [*]	.08		.22 [*]	.06		.31 ^{**}	.11		.22 [*]	.08		.30 [*]	.09
Step 3	.04 [*]			.04 [*]			.02			.00			.00		
Negative Affectivity		-.14 [*]	.02		-.07 [*]	.00		.05 [*]	.00		-.02 [*]	.00		.17	.03
AS		.43 ^{**}	.14		.31 [*]	.06		.22 [*]	.03		.57 ^{***}	.23		.06	.06
Smoking History		.22 [*]	.07		.21 [*]	.06		.31 ^{**}	.11		.21 [*]	.08		.29 [*]	.08
AS × Smoking History ^a		.27 [*]	.06		.29 [*]	.06		.19	.02		.10	.01		.05	.00

Note. $n = 64$; β = standardized beta weight; AS = anxiety sensitivity.

^a Interaction term for Anxiety Sensitivity Index (Silverman et al., 1991) scores and lifetime smoking status (coded: 0 = never smoked; 1 = positive smoking history).