



## Short Communication

## Anxiety sensitivity moderates drug cravings in response to induced negative affect in opioid dependent outpatients

Georgia Stathopoulou<sup>a,\*</sup>, Mark H. Pollack<sup>b</sup>, Michael W. Otto<sup>c</sup><sup>a</sup> Addiction Medicine, Massachusetts General Hospital and Harvard Medical School, Boston, MA, United States<sup>b</sup> Department of Psychiatry, Rush University Medical Center, Chicago, IL, United States<sup>c</sup> Department of Psychological and Brain Sciences, Boston University, Boston, MA, United States

## HIGHLIGHTS

- Anxiety Sensitivity significantly moderated drug cravings in response to negative affect induction.
- Only among individuals with high anxiety sensitive scores, anxiety sensitivity moderated drug cravings.
- Coping motives did not significantly predict drug cravings in response to negative affect induction.

## ARTICLE INFO

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## 1. Introduction

Anxiety sensitivity is defined as the tendency to fear anxiety-related sensations due to beliefs that these sensations have negative physical, mental, and/or social consequences (Peterson & Reis, 1992). Although anxiety sensitivity was initially conceptualized as a specific vulnerability factor for panic disorder, due to the prominence of fears of anxiety symptoms in that disorder (McNally, 2002), it has since been established more broadly as a measure of distress intolerance (McHugh & Otto, 2011; Otto et al., 2016). The role of anxiety sensitivity in relation to drug use and other negative health behaviors can be characterized as an amplifying factor, enhancing the aversiveness and need to escape/avoid negative affective or somatic experiences, thereby increasing the likelihood of maladaptive coping strategies (Otto et al., 2016). The use of drugs to escape from negative affect/sensations is conceptualized in terms of coping motives. Coping motives for drug use are one of three motives outlined by Cooper, Russell, Skinner, and Windle (1992); the other two motives are enhancement motives and social motives. Coping motives have been linked to more problematic alcohol use compared to the other motives (Kuntsche, Knibbe, Gmel, & Engels, 2005).

Anxiety sensitivity has been linked to coping motives for smoking (e.g., Guillot, Leventhal, Raines, Zvolensky, & Schmidt, 2016; Zvolensky, Feldner, Leen-Feldner, & McLeish, 2005), alcohol use (e.g., Novak, Burgess, Clark, Zvolensky, & Brown, 2003; Paulus et al., 2017; Stewart, Zvolensky, & Eifert, 2001), and marijuana use (e.g., Bonn-Miller, Zvolensky, & Bernstein, 2007). For example, among community marijuana users, anxiety sensitivity was uniquely related to coping motives above and beyond frequency of past 30-day marijuana use, years of marijuana use, average number of cigarettes per day, and average weekly alcohol consumption (Bonn-Miller et al., 2007). Yet, relatively absent from the literature have been investigations of the specific role of anxiety sensitivity and coping motives in explaining substance craving in those with severe substance use patterns.

The present study was designed to examine the association between anxiety sensitivity, coping motives, and drug craving in response to negative affect in opioid dependent adults. We hypothesized that anxiety sensitivity would be linked to coping motives and that both variables would identify those individuals with the strongest craving responses following negative affect induction. We also hypothesized that, relative to coping motives, anxiety sensitivity would be the more

\* Corresponding author at: Massachusetts General Hospital, 16 Blossom Street, R 114, Boston, MA 02114, United States.

E-mail address: [gstathopoulou@mgd.harvard.edu](mailto:gstathopoulou@mgd.harvard.edu) (G. Stathopoulou).

effective predictor, replacing the significance of coping motives in regression models.

## 2. Methods

### 2.1. Participants

Eligible participants were adults, aged 18 to 69 years, who had been in methadone maintenance treatment for opioid dependence for at least four months. Exclusion criteria included the presence of a psychotic disorder, current mania, current suicidal or homicidal ideation; inability to provide written consent form due to illiteracy, lack of fluency in English or inability to understand the proposed study procedures; 38 men and 38 women were recruited for the study and completed baseline measures.

### 2.2. Assessments

**SCID-IV.** All participants were interviewed using the Structured Clinical Interview for DSM-IV (SCID-IV; First, Gibbon, Spitzer, & Williams, 1995) and assessed for current substance dependence, inclusion and exclusion criteria, and also for mood and anxiety disorders.

**Anxiety Sensitivity Index (ASI; Peterson & Reis, 1992).** The Anxiety Sensitivity Index is a 16-item questionnaire that assesses fears of anxiety-related symptoms and has served as an important predictor of a wide variety of negative health behaviors (Otto et al., 2016). The ASI has demonstrated strong internal consistency ( $\alpha = 0.82\text{--}0.91$ ; Peterson & Reis, 1992).

**Drug Use Motives Questionnaire (DUMQ).** The DUMQ is a modification of the Drinking Motives Questionnaire (DMQ; Cooper et al., 1992), a 15-item self-report scale designed to measure three different reasons for substance use: coping, enhancement, and social motives. Consistent with past applications of the measure to substances other than alcohol (e.g., Comeau, Stewart, & Loba, 2001), the general term drug use replaced the term alcohol use.

**Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988).** The PANAS is a Likert-style self-report measure with 10 items measuring positive affect and 10 measuring negative affect. We used the negative affect scale to assess response to the affect induction procedure.

**Illicit Substance Craving Scale.** We used the sum of two items from the Cocaine Craving Scale (Weiss, Griffin, & Hufford, 1995) modified to assess in-the-moment craving to any illicit substance: “Please rate how strong your desire is to use illicit substances right now,” and “Please imagine yourself in the environment in which you previously used drugs and/or alcohol. If you were in the same situation right now, what is the likelihood that you would use drugs?”. The score submitted for analysis was the mean of these two ratings.

### 2.3. Affect induction procedures

Film clips are an effective affect-induction strategy (Rottenberg, Ray, & Gross, 2007). For the current study we used two three-minute clips validated by Gross and Levenson (1995) to induce sadness; “The Champ,” (Lovell & Zefirelli, 1979), and “Bambi” (Disney & Hand, 1942). Consistent with past cue-reactivity studies (e.g., Sinha, Fuse, Aubin, & O'Malley, 2000), reactivity to affect induction was assessed through the change scores (post-induction minus pre-induction) ratings of affective state.

### 2.4. Study procedures

Fliers advertised a study of “attitudes and substance cravings” at a methadone clinic. After providing informed consent, potential participants were interviewed for diagnostic characteristics and drug use, and

those meeting appropriate criteria were then asked to complete the Anxiety Sensitivity Index, DUMQ, PANAS, and the ratings of illicit substance cravings. Next, the two 3 min. Film clips were presented sequentially. Before viewing the film clips, participants were given the following directions: “Let yourself experience whatever emotions you have, as fully as you can. Don't try to hold back, or hold in, your feelings” (Martin, 1990, p. 674). Immediately following film presentation, participants completed PANAS and the substance craving scale, in that order. Lastly, they completed a positive film condition designed to return their affect to the baseline state. After debriefing, they were compensated financially for their time. In all cases, the affect induction procedures occurred one to three hours after methadone dosing in order to reduce variability in mood due to opioid withdrawal.

## 3. Results

### 3.1. Participant characteristics

In addition to opioid dependence, study participants were characterized by chronic, polysubstance use and high rates of psychiatric comorbidity; see Table 1. The mean anxiety sensitivity score for the sample was 30.7 ( $SD = 12.7$ ); this score was over one standard deviation above adult non-clinical norms ( $M = 19.1$ ;  $SD = 9.1$ ), and within the range for anxiety disorders patients ( $M = 32.1$ ;  $SD = 11.3$ , including those with panic disorder with moderate/severe agoraphobia; Peterson & Reis, 1992). Contrary to expectation, anxiety sensitivity was

**Table 1**

Demographic, substance use, and diagnostic characteristics of the sample of 76 opioid dependent outpatients.

	Number	Percent		
<b>Race and ethnicity</b>				
White	37	48.7%		
Black/African American	27	35.5%		
White Hispanic	4	5.3%		
Not reported	8	10.5%		
<b>Marital status</b>				
Single/never married	24	31.6%		
Married	20	26.3%		
Divorced/separated	11	14.5%		
Widowed	2	2.6%		
Not reported	14	18.4%		
<b>Employment status</b>				
Unemployed	67	88.2%	73	95%
Employed	4	5.3%		
Not reported	5	6.6%		
<b>Education</b>				
Grade 11 or less	1	1.3%		
High school	24	31.6%		
Part college	19	25.0%		
2 yr college	9	11.8%		
4 yr college	2	2.6%		
Not reported	17	22.4%		
<b>Lifetime use of illicit substances</b>				
<b>Substance</b>				
	<b>Years of Use</b>			
	Mean	SD		
Opioids	17.2	11.2		
Cocaine	12.6	15.3		
Marijuana	15.5	13.4		
<b>Psychiatric comorbidity</b>				
	Number	Percent		
PTSD	40	52.6%		
PD	29	38.2%		
MDD	20	26.3%		
BD	17	22.4%		
GAD	9	11.9%		

Note: SD: Standard Deviation; PTSD: Posttraumatic Stress Disorder; PD: Panic Disorder; MDD: Major Depressive Disorder; BP: Bipolar Disorder; GAD: Generalized Anxiety Disorder.

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