Psychology of Addictive Behaviors

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Gender-Specific Associations Between Trauma Cognitions, Alcohol Cravings, and Alcohol-Related Consequences in Individuals With Comorbid PTSD and Alcohol Dependence

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University of Pennsylvania

The current study examined gender-specific associations between trauma cognitions, alcohol cravings and alcohol-related consequences in individuals with dually diagnosed PTSD and alcohol dependence (AD). Participants ($N = 167$) had entered a treatment study for concurrent PTSD and AD; baseline information was collected from participants about PTSD-related cognitions in three areas: (a) Negative Cognitions About Self, (b) Negative Cognitions About the World, and (c) Self-Blame. Information was also collected on two aspects of AD: alcohol cravings and consequences of AD. Gender differences were examined while controlling for PTSD severity. The results indicate that Negative Cognitions About Self are significantly related to alcohol cravings in men but not women, and that interpersonal consequences of AD are significantly related to Self-Blame in women but not in men. These findings suggest that for individuals with comorbid PTSD and AD, psychotherapeutic interventions that focus on reducing trauma-related cognitions are likely to reduce alcohol cravings in men and relational problems in women.

Keywords: posttraumatic stress disorder, dual diagnosis, trauma cognitions, alcohol dependence, gender differences

The experience of trauma is nearly ubiquitous in American life. Recent estimates put the percentage of Americans that have experienced a traumatic event at 75%, and the number of Americans that have had posttraumatic stress disorder (PTSD) in their lifetime at 6.7% (Sledjeski, Speisman, & Dierker, 2008). Of those with lifetime PTSD, 32.7% report substance abuse or dependence (Sledjeski et al., 2008). Among individuals with lifetime alcohol dependence (AD), 10.3% of men and 26.2% of women report lifetime PTSD—more than twice the rate of the general population (Kessler et al. 1997). Many studies have shown that PTSD is more prevalent among those who report AD, and vice versa (e.g. Langeland & Hartgers, 1998; Najavits, Weiss, & Shaw, 1997), and that those with comorbid PTSD and AD have more deleterious clinical profile for both disorders (Ouimette, Wolfe, & Chrestman, 1996; Read, Brown, & Kahler, 2004; Saladin, Brady, Dansky & Kilpatrick, 1995).

Importantly, gender differences have been found in the incidence of both PTSD and AD. While rates of trauma exposure are virtually identical for men and women, 75% of those who develop PTSD following a trauma are women (Sledjeski et al., 2008). Conversely, 12-month prevalence rates of AD show that men are almost as twice as likely to meet criteria for this disorder than women (Harford, Grant, Yi, & Chen, 2005). Research has shown that gender also plays a role in the onset and presentation of these disorders. Women report more traumatic experiences involving sexual victimization and physical abuse than men (Ouimette, Kimerling, Shaw, & Moos 2000), and are more likely to report these types of experiences as the trauma most responsible for their PTSD symptoms (Grice, Brady, Dustan, & Malcolm, 1995; Sonne, Back, Zuniga, Randall, & Brady, 2003). Men with AD exhibit higher levels of tolerance, withdrawal and impaired control than females with AD (Harford et al, 2005).

Little research has been done on gender differences among individuals with comorbid AD and PTSD. Sonne et al. (2003) found that compared to women, men with comorbid PTSD and AD reported greater alcohol use and craving, and more alcohol-related legal problems, whereas women reported greater frequency and intensity of trauma-related avoidance, and greater social impairment due to PTSD. Importantly, this study also found that PTSD preceded AD more often in women than in men, and that PTSD was primary over AD more often in women, whereas in men, the opposite was true. Similarly, other studies suggest that although men show higher absolute levels of comorbid alcohol use, women start drinking excessively after experiencing a trauma in order to manage trauma-related symptoms, like intrusive memories and dissociation (Clark et al., 1995, 1997; Deykin & Buka, 1997; Lipschitz et al., 2000; Najavits, Weiss, & Shaw, 1997).

Few studies have explored the mechanisms that might explain the gender differences in the onset and presentation of these two comorbid disorders. A single study in this area found that difficulty controlling impulsive behavior partially explained the relationship

Nuwan Jayawickreme, Carly Yasinski, Monnica Williams, and Edna B. Foa, Center for the Treatment and Study of Anxiety, Department of Psychiatry, University of Pennsylvania, School of Medicine.

Carly Yasinski is now at the Department of Psychology, University of Delaware.

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Correspondence concerning this article should be addressed to Nuwan Jayawickreme, Center for the Treatment and Study of Anxiety, University of Pennsylvania, School of Medicine, Department of Psychiatry, Philadelphia, PA 19104. E-mail: nuwanj@mail.med.upenn.edu

between PTSD and substance use for women, whereas lack of emotional awareness partially explained this relationship in men (Bornovalova, Ouimette, Crawford, & Levy, 2009).

In contrast, there is a large body of research examining sex differences in alcohol craving. In particular, there is evidence that males are more likely to crave alcohol in response to stress whereas women are more likely to ruminate. Chaplin, Hong, Bergquist, and Sinha (2008) found that greater subjective negative emotion was correlated with stress- and alcohol-cue-related alcohol cravings in males but not in females. Chaplin et al (2008) suggested that females are more likely to focus cognitively on feelings of sadness and anxiety compared to males, who are more likely to distract their attention away from such emotional states and therefore drink. Fox and Sinha (2009) note that this particular difference may be due to gender differences in stress and reward systems of the brain, such as the hypothalamic-pituitary-adrenal axis (HPA) and the sympathetic adrenal medullary (SAM) systems.

No studies have examined the gender differential in the relationship between trauma-related negative cognitions and AD in individuals with comorbid PTSD and AD. Numerous theories as well as a growing body of research have noted the importance such cognitions play in the development and maintenance of PTSD (Ehlers & Clark, 2000; Foa & Kozak, 1986; Janoff-Bulman, 1992; see Dalgleish, 2004 for a review). In particular, Foa and colleagues have used emotional processing theory (Foa & Kozak, 1986) to explain how PTSD develops when a trauma changes pre-existing beliefs about competence and safety in the world. Specifically, if the trauma disconfirms rigid perceptions either that the self is completely competent or that the world is completely safe, or confirms pre-existing beliefs that the self is completely incompetent and the world is completely dangerous, then PTSD is likely to develop (Foa & Cahill, 2001). In the present study we used the Posttraumatic Cognitions Inventory or PTCI (Foa, Ehlers, Clark, Tolin, and Orsillo, 1999) to examine this relationship. The PTCI is a measure of trauma-related thoughts and beliefs classified into three categories: (a) Negative Cognitions About Self, (b) Negative Cognitions About the World, and (c) Self-Blame. Each of these three categories has, in different studies, been shown to be correlated with measures of PTSD severity and depression (Foa et al., 1999; Beck et al, 2004; Moser, Hajack, Simons, & Foa, 2007).

This study aims to explore gender differences between PTSD-related cognitions as measured by the PTCI and two aspects of AD, namely alcohol cravings and consequences of AD. We examined alcohol craving even though it is not a DSM–IV (American Psychiatric Association, 1994) criteria for AD, as a body of research suggests that that craving is a hallmark symptom of AD and is associated with withdrawal, treatment outcome and relapse (Ludwig & Wikler, 1974; Singleton & Gorelick, 1998; Sinha & O'Malley, 1999). Based on the results of Chaplin et al. (2008), we hypothesize that trauma-related cognitions will be related to alcohol craving in men, but not women, given that men tend to respond to stressors with alcohol cravings. We will also examine correlations among the different types of trauma cognitions and different consequences of AD for males and females.

Method

Participants

The current study examined baseline data collected from 167 treatment-seeking individuals who were recruited through advertisements, personal, and professional referrals to the University of Pennsylvania's Center for the Treatment and Study of Anxiety as part of a comorbid PTSD/AD treatment outcome study. Demographic information for the sample can be found in Table 1. Inclusion criteria included current PTSD resulting from a trauma that occurred at least a month prior to intake, as measured by the Posttraumatic Symptom Scale-Interview (PSS-I; Foa, Riggs, Dancu, & Rothbaum, 1993), and current AD, as measured by the DSM–IV (APA, 1994). Exclusion criteria included (a) any current substance dependence other than alcohol, nicotine, or cannabis; (b) psychotic disorder or thoughts; (c) bipolar disorder I or II; (d) reported opiate use in the prior month; (e) medical illnesses that would interfere with treatment (e.g., AIDS, active hepatitis, or significant hepatocellular injury determined by bilirubin levels); or (f) pregnancy, nursing, or high risk of pregnancy. However, individuals who also met abuse criteria for other substances apart from opiates were included in the study. Participants who needed alcohol detoxification were either referred to an inpatient detoxification facility or, if they were deemed suitable, received detoxification on an outpatient basis from the study psychiatrist and nurse. Baseline data were collected from these individuals only after they had completed detoxification.

Procedure

Once participants were deemed eligible for the present study, they were scheduled for a full baseline evaluation prior to beginning any treatment. Demographic and psychological data were collected at this baseline evaluation by trained assessment clinicians blinded to the future condition of the participant, and through

Table 1
Demographic Characteristics of Patients

Gender	
Male, *N* (%)	109 (65.3)
Female, *N* (%)	58 (34.7)
Race	
African American, *N* (%)	107 (64.1)
Caucasian, *N* (%)	50 (29.9)
Hispanic, *N* (%)	7 (4.2)
Other, *N* (%)	3 (1.8)
Marital Status	
Single, *N* (%)	82 (49.1)
Married/ Partnered, *N* (%)	36 (21.6)
Divorced/Separated, *N* (%)	43 (25.7)
Other, *N* (%)	5 (3.0)
Employed at least part-time, *N* (%)	58 (34.8)
Age, Mean (*SD*)	42.6 (9.79)
Education	
Some high school, *N* (%)	20 (12)
High school graduate, *N* (%)	61 (36.5)
Associates Degree/Some college, *N* (%)	59 (35.3)
College, *N* (%)	12 (7.2)
Some graduate school, *N* (%)	14 (8.4)
Other, *N* (%)	1 (0.6)

self-report questionnaires, administered to the participant during the same visit.

Measures

The following measures were administered to participants as part of a larger battery:

(a) *The PTSD Symptom Severity Interview* (PSS-I; Foa et al., 1993), a clinician rated interview consisting of 17 items corresponding to the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM–IV*; American Psychiatric Association, 1994) PTSD symptoms. Items are rated on 0–3 scales for combined frequency and severity in the past two weeks (0 = *not at all*, 3 = *5 or more times per week/very much*). Interrater reliability for PTSD diagnosis (κ = .91) and overall severity (r = .97) are excellent (Foa et al., 1993).

(b) *The Posttraumatic Cognitions Inventory* (PTCI; Foa et al., 1999), a 36 item self-report questionnaire that assesses negative cognitions about self, negative cognitions about the world, and self-blame which are hypothesized to be associated with both poor recovery from traumatic experiences and the maintenance of PTSD. Three of these items are experimental and are not included when calculating subscale scores. Individuals rate the occurrence of thoughts and beliefs using a four-point Likert scale ranging from 0 (*totally disagree*) to 3 (*totally agree*). The measure loads on three factors: (a) Negative Cognitions About Self (*PTCI-Self*; 21 items), (b) Negative Cognitions About the World (*PTCI-World*; 7 items), and (c) Self-Blame (*PTCI-Blame*; 5 items). The Negative Cognitions About Self scale includes items that examine the extent to which the individual has a negative view of him/herself and symptoms and thoughts of helplessness and alienation (e.g., "I am a weak person"). The Negative Cognitions About the World scale includes items that examine the degree to which the individual is distrustful of others and believes the world to be unsafe (e.g., "People can't be trusted"). Finally, the Self-Blame scale has items that examine the extent to which the individual believes he or she is responsible for the occurrence of the traumatic event (e.g., "The event happened because of the way I acted"). These three subscales are intercorrelated (rs = .57–.75). The PTCI shows sound psychometric properties: internal consistency: α_{Total} = .97, α_{Self} = .97, α_{World} = .88, and α_{Blame}= .86; test–retest reliabilities, 1-week retest interval: ρ_{Total} = .74, ρ_{Self} = .75, ρ_{World}= .89, and ρ_{Blame} = .89, and 3-week retest interval: ρ_{Total} = .85, ρ_{Self} = .86, ρ_{World} = .81, and ρ_{Blame} = .80 (Foa et al., 1999). The PTCI has excellent convergent and discriminant validity. Foa et al. (1999) found that the PTCI better discriminated traumatized individuals with and without PTSD compared to the World Assumptions Scale (Janoff-Bulman, 1989; Janoff-Bulman, 1992) and the Personal Beliefs and Reactions Scale (Mechanic & Resick, 1993), both of which do not include cognitions specific to the sequelae of traumatic events (Foa et al., 1999). In accordance with the original scoring procedure, scale scores were calculated as the mean item score (Foa et al., 1999).

(c) *The Drinker Inventory of Consequences* (DrInC; Miller, Tonigan, & Longabaugh, 1995), a self-administered 50-item questionnaire that assesses current adverse consequences of AD in five areas: Interpersonal, Physical, Social, Impulsive, and Intrapersonal. The 2-day, test-retest reliability of the DrInC for recent consequences is high (Pearson r = .93 for the full scale, and .92, .93, .96, .79, and .91 for the five subscales), and comparable values were obtained for the lifetime consequences version as well. Cronbach's α also revealed good internal consistency for all scales (α = .94, .74, .80, .86, .70, & .85 for the total scale and subscales, respectively).

(d) *Penn Alcohol Craving Scale* (PACS; Flannery, Volpicelli, & Pettinati, 1999), a 5-item self-administered instrument that assesses alcohol craving. This includes assessment of the frequency, intensity, and duration of thoughts about drinking, ability to resist drinking, and average rating of alcohol craving over the past week; The PACS has been found to have excellent reliability (Cronbach's α = .92), high item-total correlations (r^2 = .80–.92), and good concurrent validity (r^2 = .55) with the Obsessive Compulsive Drinking Scale (Modell et al., 1992), a similar measure of alcohol craving (Flannery et al., 1999).

(e) *The Beck Depression Inventory* (BDI; Beck, Ward, & Mendelsohn, 1961), a 21-item self-report questionnaire that assesses severity of depressive symptoms within the past two weeks. A review of the psychometric properties of the BDI by Beck, Steer, & Garbin (1988) found mean coefficient alphas of .86 for psychiatric patients and .81 for nonpsychiatric patients. The BDI also possesses acceptable split-half reliability (r = .86) (Beck et al., 1961). It has been shown to correlate with clinical ratings as well as other measurements of depression (Beck et al., 1988).

(f) *Standardized Trauma Interview* (STI; Foa, Hembree, & Rothbaum, 2007), a 94-item clinician-rated interview that assesses demographic information, and details about the trauma and posttraumatic reactions, such as suicide attempts and alcohol use.

Statistical Analysis

Correlations between all scales and subscales were assessed using Pearson Product Moment Correlations. Given that there were twice as many men as women in the current sample, regression analyses using the full sample with interaction terms between gender and the PTCI subscales were not possible as there would have been insufficient power to detect differences between the genders. Instead, the data was stratified according to gender and separate hierarchical regression analyses were conducted for male and female participants to predict adverse consequences of AD and alcohol craving severity as a function of PTSD severity and trauma cognitions.

Results

Descriptive Statistics and First Order Correlations

Descriptive statistics for the full sample and for male and female participants are presented in Table 2. Correlations for male and female participants were also calculated to determine the relationships between trauma cognitions, as measured by the PTCI (Foa et al., 1999), PTSD severity, as measured by the PSS-I, alcohol craving severity, as measured by the PACS and adverse consequences of AD, as measured by the DrInC. These correlations are presented in Table 3.

With regards to the relationship between trauma-related cognitions and alcohol craving severity, correlations indicated that the Negative Self, Negative World, and Self-Blame subscales of the PTCI were significantly related to alcohol craving severity in the full sample (r =.37, $p < .01$, r = .21, $p < .01$, r = .22, $p <$ .01, respectively) and in male participants (r =.49, $p < .01$, r =

Table 2
Means and Standard Deviations for Measured Variables

Variables	*N*	Mean	*SD*
Age			
Total	167	42.60	9.79
Male	109	42.69	10.02
Female	58	42.45	9.42
PSS-I			
Total	167	28.38	8.26
Male	109	28.28	8.53
Female	58	28.59	7.78
PTCI − Self			
Total	153	3.70	1.35
Male	99	3.59	1.35
Female	54	3.91	1.34
PTCI − World			
Total	154	5.04	1.26
Male	99	5.03	1.16
Female	55	5.05	1.44
PTCI − Self-Blame			
Total	155	3.18	1.48
Male	100	3.20	1.42
Female	55	3.15	1.58
PACS			
Total	167	18.12	7.12
Male	109	17.97	6.85
Female	58	18.38	7.66
DrInC			
Total	146	29.89	10.81
Male	93	30.08	11.01
Female	53	29.56	11.59
DrInC − Physical			
Total	148	5.58	2.17
Male	95	5.50	2.17
Female	53	5.73	2.19
DrInC − Interpersonal			
Total	148	6.73	2.92
Male	95	6.69	3.03
Female	53	6.79	2.74
DrInC − Intrapersonal			
Total	147	6.25	2.25
Male	94	6.04	2.40
Female	53	6.62	1.94
DrInC − Impulsive**			
Total	146	6.62	2.89
Male	93	7.04	2.83
Female	53	5.87	2.88
DrInC − Social			
Total	149	4.72	2.30
Male	96	4.81	2.34
Female	53	4.57	2.24

Note. *N* = number of cases. PSS-I = Posttraumatic Symptom Scale − Interview Version; PTCI Self = Posttraumatic Cognitions Interview − Negative Cognitions About Self Subscale; PTCI World = Posttraumatic Cognitions Interview − Negative Cognitions About the World Subscale; PTCI Self-Blame = Posttraumatic Cognitions Interview − Self-Blame Subscale; PACS − Penn Alcohol Craving Scale; DrInC = Drinker Inventory of Consequences; DrInC Physical = Drinker Inventory of Consequences − Physical Consequences Subscale; DrInC Interpersonal = Drinker Inventory of Consequences − Interpersonal Consequences Subscale; DrInC Intrapersonal = Drinker Inventory of Consequences − Intrapersonal Consequences Subscale; DrInC Impulsive = Drinker Inventory of Consequences − Impulsive Consequences Subscale; DrInC Social = Drinker Inventory of Consequences − Social Consequences.
** The difference in scores on DrInc Impulsive between the genders was significant, $t(144) = 2.41$, $p = .02$, and it represented a small-to-medium sized effect $d = .41$.

.24, $p < .01$, $r = .26$, $p < .01$, respectively). However, the PTCI subscales were not significantly related to alcohol craving severity in women. These correlational analyses indicated that trauma-related cognitions are related to alcohol cravings in men, but not women, and that the significant relationship between trauma-related cognitions and increased alcohol cravings in the full sample is driven by the men in the sample.

With regards to the relationship between the PTCI and adverse consequences of AD in the full sample, DrInC total scores were significantly related to the Negative Self and Self-Blame subscales of the PTCI ($r = .32$, $p < .01$, and $r = .22$, $p < .01$, respectively), indicating that increased negative trauma-related cognitions related to self and self-blame were related to more severe adverse consequences of alcohol AD. When evaluating the subscales of the DrInC in the full sample, all subscales of the DrInC (Physical, Interpersonal, Intrapersonal, Impulsive, and Social) were significantly related to the Negative Self subscale of the PTCI ($r = .29$, $p < .01$, $r = .32$, $p < .01$, $r = .31$, $p < .01$, $r = .21$, $p < .01$, and $r = .31$, $p < .01$, respectively). Furthermore, all subscales other than the Intrapersonal subscale of the DrInC (namely, the Physical, Interpersonal, Impulsive, and Social subscales) were significantly related to Self-Blame subscale of the PTCI ($r = .17$, $p < .05$, $r = .15$, $p < .05$, $r = .20$, $p < .01$, and $r = .20$, $p < .01$, respectively).

Correlations between the PTCI and adverse consequences of AD differed based on gender. Similar to the full sample, DrInC total scores for male participants were significantly related to the Negative Self and Self-Blame subscales of the PTCI ($r = .34$, $p < .01$, $r = .16$, $p < .05$, respectively), indicating that increased negative cognitions related to self and self-blame were related to more severe adverse consequences of AD. Furthermore, in men, all subscales of the DrInC (Physical, Interpersonal, Intrapersonal, Impulsive, and Social) were significantly related to the Negative Self subscale of the PTCI ($r = .30$, $p < .01$, $r = .30$, $p < .01$, $r = .33$, $p < .01$, $r = .25$, $p < .05$, $r = .38$, $p < .01$, respectively). The Impulsive subscale of the DrInC was significantly related to Self-Blame subscale of the PTCI ($r = .25$, $p < .01$). These correlations broadly indicated that negative cognitions about the self and self-blame were associated with more severe adverse consequences of AD, with the Impulsive subscale of the DrInC driving the relationship between the DrInC total score and the PTCI Self-Blame subscale.

With female participants, DrInC total scores were significantly related to the Negative Self and Self-Blame subscale of the PTCI ($r = .27$, $p < .05$ and $r = .25$, $p < .05$), indicating that increased negative cognitions about the self and self-blame was related to more severe adverse consequences of alcohol AD. Furthermore, for women, the interpersonal, intrapersonal and impulsive subscales of the DrInC were significantly related to the Negative Self subscale of the PTCI ($r = .40$, $p < .01$, $r = .24$, $p < .05$ and $r = .24$, $p < .05$ respectively). Also, the interpersonal, impulsive, and social subscales of the DrInC were significantly related to the Self-Blame subscale of the PTCI ($r = .32$, $p < .05$, $r = .24$, $p < .05$ and $r = .27$, $p < .05$ respectively). These correlations indicated that increased trauma cognitions about the self were associated with more severe adverse consequences of alcohol AD related to interpersonal and intrapersonal problems and impulsivity, whereas increased trauma cognitions associated with self-blame were associated with adverse consequences of AD related to interpersonal and social problems and impulsivity.

Table 3
Correlations for Measured Variables

	1	2	3	4	5	6	7	8	9	10	11
1. PSS-I	—	.63**	.46**	.26**	.30**	.22*	.21*	.22*	.24*	.11	.24**
2. PTCI − Self	.55**	—	.57**	.54**	.49**	.34**	.30**	.30**	.33**	.25*	.38**
3. PTCI − World	.45**	.59**	—	.25**	.24**	.10	.15	.09	.04	.09	.06
4. PTCI − Self-Blame	.16	.56**	.37**	—	.26**	.16*	.20	.04	.09	.25**	.17
5. PACS	.08	.20	.14	.14	—	.33**	.28**	.24**	.27**	.29**	.34**
6. DrInC	.12	.27*	.04	.25*	.16	—	.83**	.90**	.83**	.83**	.87**
7. DrInC − Physical	.16	.23	.06	.12	.12	.82**	—	.64**	.63**	.68**	.64**
8. DrInC − Interpersonal	.14	.40**	.12	.32*	.14	.88**	.68**	—	.78**	.67**	.77**
9. DrInC − Intrapersonal	.05	.24*	−.01	.16	.15	.85**	.76**	.72**	—	.50**	.74**
10. DrInC − Impulsive	.09	.24*	.03	.24*	.11	.90**	.68**	.75**	.68**	—	.64**
11. DrInC − Social	.23	.22	.07	.27*	.25*	.88**	.66**	.71**	.73**	.74**	—

Note. Correlations above the diagonal represent males in the sample; correlations below the diagonal represent females in the sample. There was variability in the number of participants (*N*) in each analysis. PSS-I = Posttraumatic Symptom Scale − Interview Version; BDI = Beck Depression Inventory; PTCI Self = Posttraumatic Cognitions Interview − Negative Cognitions About Self Subscale; PTCI World = Posttraumatic Cognitions Interview − Negative Cognitions About the World Subscale; PTCI Self-Blame = Posttraumatic Cognitions Interview − Self-Blame Subscale; PACS − Penn Alcohol Craving Scale; DrInC = Drinker Inventory of Consequences; DrInC Physical = Drinker Inventory of Consequences − Physical Consequences Subscale; DrInC Interpersonal = Drinker Inventory of Consequences − Interpersonal Consequences Subscale; DrInC Intrapersonal = Drinker Inventory of Consequences − Intrapersonal Consequences Subscale; DrInC Impulsive = Drinker Inventory of Consequences − Impulsive Consequences Subscale; DrInC Social = Drinker Inventory of Consequences − Social Consequences.
* $p < .05$. ** $p < .01$.

Regression Analyses

Given that alcohol cravings was significantly associated with trauma cognitions in males but not females, hierarchical regression analyses were conducted to predict alcohol craving severity in male participants as a function of PTSD severity and trauma cognitions. Four predictors in the analyses were included: PSS-I, PTCI-Self, PTCI-World, and PTCI-Self-Blame[1]. PTSD severity (PSS-I scores) were entered as Block 1 and trauma cognitions (PTCI- Self, PTCI-World, and PTCI-Self-Blame) were entered as Block 2. Trauma cognitions significantly contributed to the model, predicting alcohol craving in males. The results of the regression analysis are presented in Table 4.

As Table 4 demonstrates, PTSD severity accounted for a small amount of the variance in alcohol cravings ($R^2 = .26$, $p < .001$).

Table 4
Summary of Hierarchical Regression Analysis for Variables Predicting Alcohol Craving in Males (N = 99)

Variable	*B*	*SE B*	β
Step 1			
Constant	10.88	2.25	
PSS-I	0.26	0.08	0.32*
Step 2			
Constant	11.18	3.02	
PSS-I	0.00	1.00	0.01
PTCI – Self	2.99	0.79	0.59*
PTCI – World	−0.65	0.70	−0.11
PTCI – Self-Blame	−0.21	0.53	−0.04

Note. $R^2 = .32$ for Step 1; $\Delta R^2 = .15$ for Step 2 (*p*s = .001). PSS-I = Posttraumatic Symptom Scale − Interview Version; PTCI − Self = Posttraumatic Cognitions Interview − Negative Cognitions About Self Subscale; PTCI − World = Posttraumatic Cognitions Interview − Negative Cognitions About the World Subscale; PTCI − Self-Blame = Posttraumatic Cognitions Interview − Self-Blame Subscale.
* $p < .001$.

The subscales of the PTCI (Block 2) accounted for a significant amount of variance in alcohol craving severity ($\Delta R^2 = .15$, $p < .001$). The final model accounted for approximately 25.3% of the total variance in alcohol craving severity. Table 4 shows that only one of the three variables in Block 2 significantly predicted alcohol craving severity. In particular, PTCI-Self was associated with significant predictive value in alcohol cravings ($\beta = .59$, $p < .001$) with increased trauma cognitions about the self being associated with more severe alcohol cravings.

Discussion

The purpose of the present study was to examine, for the first time to our knowledge, gender differences in trauma cognitions and their relationship to symptoms of AD. Overall, the findings suggest the presence of significant gender differences in the relationship between trauma cognitions and symptoms of AD. Negative self-perception, negative beliefs about the world and a tendency to blame oneself are all significantly related to the intensity of alcohol cravings in males, but not in females. Specifically, negative cognitions about the self were associated with strength of alcohol craving in males, but not females. This finding suggests that negative cognitions related to traumatic experiences results in a greater desire to drink in men, but not in women. This is consistent with Chaplin et al. (2008)'s finding that greater subjective negative emotion was correlated with stress- and alcohol-cue-related alcohol cravings in males but not in females. Several studies have indicated that women tend to acknowledge and value experiencing emotions compared to men, who tend to be more avoidant of emotions (e.g., Nolen-Hoeksema, 2000; Thayer et al.,

[1] We conducted correlations and one-ways ANOVAS examining the relationship between demographic variables and the outcomes of interest (cravings and alcohol consequences) and found no significant relations; thus, demographic variables were not included in the regression.

2003; van Middendorp et al., 2005). Given that classic cognitive theories of psychopathology state that cognition drives the experience of emotion (see Alloy & Riskind, 2005), it could be that men avoid processing these negative cognitions and instead drink in order to cope with these distressing thoughts. This explanation may shed light on Sonne et al.'s (2003) finding that men with comorbid PTSD and AD have greater intensity of alcohol craving: perhaps alcohol cravings in men are the result of maladaptive coping of these emotionally-laded cognitions.

The relationship between negative trauma-related cognitions and adverse consequences of AD also differed among men and women. In particular, interpersonal consequences of drinking were significantly related to self-blame in women, but not in men. This finding may explain Sonne et al.'s (2003) finding that women with comorbid PTSD and AD reported greater social impairment due to PTSD compared to men. The current findings suggest that the social difficulties suffered by women who struggle with both PTSD and AD is related to unhelpful beliefs that they should be blamed for the traumas they experienced and their difficulty coping with them. It could be that believing that one was ineffective, incompetent and culpable during an experienced trauma amplifies the distress that females feel when their drinking results in problems in their interpersonal relationships, a domain that females tend to be more oriented to compared to men (Eagly, 1987).

Limitations of this study include the cross-sectional design and its reliance on self-report. Additionally, the majority of the 167 participants in the current study were men. A more equal number of males and females would have allowed us to conduct a regression analysis with interaction terms between gender and the PTCI subscales, which would be a more robust test of our hypotheses. Further, the current sample did not include individuals who needed alcohol detoxification. It is possible that those who need detoxification potentially represent a more severe sample to which the current results may not generalize. Also, all participants in this study were treatment seekers; the present results may not generalize to the general population of comorbid PTSD/AD. In particular, given that men are less likely to seek psychological treatment compared to women (Oliver, Pearson, Coe, & Gunnell, 2005), it is possible that the men in this study do not represent the entire population of PTSD/AD sufferers. Finally, these results may not generalize to individuals who also have another substance dependence disorder, abuse opiates or have a serious mental illness, since these individuals were excluded from the current study.

Despite these limitations, the current findings illuminate our understanding of the gender differences in trauma-related cognitions in those who suffer from both PTSD and AD, and have a number of implications for future clinical applications and research. Specifically, psychotherapeutic interventions that focus on reducing trauma-related cognitions are likely to reduce alcohol cravings in men with comorbid PTSD and AD. Furthermore, a focus on trauma-related beliefs related to self-blame in psychotherapy may lead to a reduction in relational problems in women and to improved overall functioning.

In terms of future research directions, differential item functioning analyses based on item response theory offer a promising next step and can be employed to determine if gender differences on PTCI items are the result of actual gender differences in levels of psychopathology. The results of such studies would allow us to differentially target particular trauma cognitions that underlie PTSD, alcohol cravings and adverse consequences of alcohol.

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