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Race-specific associations between trauma cognitions and symptoms of alcohol dependence in individuals with comorbid PTSD and alcohol dependence

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ABSTRACT

Posttraumatic Stress Disorder (PTSD) changes the way people think about themselves, others, and the safety of the world. These cognitions may play a role in alcohol dependence, where alcohol dependence is maintained as an attempt to manage posttraumatic anxiety. The current study examined black–white differences in various PTSD cognitions and their relationship to symptoms of alcohol dependence in a dually diagnosed sample (N = 167). Analyses revealed racial differences in trauma cognitions and their impact on symptoms of alcohol dependence, suggesting that trauma cognitions are more strongly associated with adverse consequences of drinking and alcohol craving severity among African Americans than European Americans. Additional relationships between ethnic identification and trauma-related cognitions are described and theoretical and clinical implications of these findings are discussed.

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1. Introduction

The experience of a traumatic event can have a negative impact on the way people think and feel about themselves, others, and the world in which they live (Dalgleish, 2004). Insomuch that thoughts and feelings are often related (Jayawickreme, Yasinski, Williams, & Foa, 2011), trauma cognitions may play a role in choices made surrounding alcohol use and abuse. Alcohol dependence (AD) can be maintained as a maladaptive attempt to manage posttraumatic anxiety through drinking (e.g., Coffey, Stasiewicz, Hughes, & Brimo, 2006), and it is no surprise that higher rates of posttraumatic stress disorder (PTSD) have been found among those who report AD, and vice versa (e.g., Langeland & Hartgers, 1998; Najavits, Weiss, & Shaw, 1997). The co-occurrence of these two disorders results in worse physical and mental health consequences and poorer treatment outcomes than either alone (Ouimette, Wolfe, & Chrestman, 1996; Read, Brown, & Kahler, 2004; Saladin, Brady, Danksy, & Kilpatrick, 1995).

While there have been studies that have examined the role of race in the development and symptom presentation of PTSD (see Pole, Gane, & Kulkarni, 2008 for a review), there has been scarce research focused on racial differences in patients with a dual diagnosis of PTSD and AD. One large study found that 15.8% of people with PTSD also suffer from co-morbid AD, with white persons at a higher risk than black persons for alcohol abuse and AD (Breslau, Davis, &

Schultz, 2003). However, there is some evidence that symptoms in African Americans may be more severe; Penk et al. (1989) found that African American alcohol and drug abusers who experienced heavy combat in Vietnam suffered from greater post-war dysfunction compared to a similar group of European Americans. Furthermore, African Americans in this sample scored higher on the Minnesota Multiphasic Personality Inventory (MMPI) scales for paranoid and psychotic symptoms (Penk et al., 1989), which could be interpreted as an indication of greater negative cognitions about others and decreased beliefs about a safe world.

No studies have explored racial differences in trauma-related beliefs and cognitions in a dually-diagnosed PTSD and AD sample. 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). Foa and colleagues developed the Posttraumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999) to measure three categories of these negative, trauma-related cognitions: negative cognitions about self, negative cognitions about the world, and self-blame. Each of these three categories has, in various studies, been shown to be correlated with PTSD severity and depression (Beck et al., 2004; Foa et al., 1999; Moser, Hajcak, Simons, & Foa, 2007). In particular, Foa et al.

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(1999) found that individuals with a diagnosis of PTSD had more negative beliefs about the world and themselves compared to individuals who had experienced a trauma but did not meet criteria for PTSD. Additionally, Zoellner, Feeny, Fitzgibbons, and Foa (1999) found that female African American had lower expectations about the benevolence of the world in general, compared to European American women, and these beliefs did not change after treatment.

In their review of PTSD among racial minorities, Pole et al. (2008) argued that future research looking at racial differences should focus, among other things, on trauma variables that have been shown to be important predictors of PTSD overall. Such an approach will allow researchers to examine whether race moderates the impact between established predictors, such as negative trauma cognitions, PTSD, and other comorbid disorders. This will allow us to better understand the impact of race on PTSD, and therefore better identify and address the psychotherapeutic needs of an increasingly diverse population.

There is scarce research on mechanisms that explain racial differences in the onset and presentation of comorbid PTSD and AD. Several large studies (the National Vietnam Veterans Readjustment Study (Kulka et al., 1990); a community sample of individuals affected by the Buffalo Creek dam collapse (Green et al., 1990); a sample drawn from four cities in the Southern USA (Norris, 1992)) indicate that African Americans have higher rates of PTSD and more severe symptoms. It is possible that one such mechanism that may explain these racial differences may be variations in trauma cognitions. Furthermore, these same trauma cognitions may also impact drinking behavior in those with a dual diagnosis of PTSD and AD.

The current study examines black–white differences in trauma cognitions as measured by the PTCI in patients with PTSD and their relationship to symptoms of AD. We examined alcohol craving even though it is not a DSM-IV (American Psychiatric Association, 1994) criteria for AD, as research indicates that craving is a hallmark symptom of AD and is related to withdrawal, treatment outcome and relapse (Ludwig & Wikler, 1974; Singleton & Gorelick, 1998; Sinha & O'Malley, 1999). Based on prior research (e.g. Zoellner et al., 1999), we hypothesize racial differences in trauma-related cognitions, with African Americans exhibiting greater negative cognitions about the world than European Americans. We also predict that African Americans will evidence greater negative consequences as a result of drinking. Due to the scarcity of research conducted on these constructs, we have no hypothesis regarding racial differences in alcohol cravings, thus this study is exploratory in that regard.

2. Methods

2.1. 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 (American Psychiatric Association, 1994). Exclusion criteria included (1) any current substance dependence other than alcohol, nicotine, or cannabis; (2) psychotic disorder or thoughts; (3) bipolar disorder I or II; (4) reported opiate use in the prior month; (5) medical illnesses that would interfere with treatment (e.g., AIDS, active hepatitis, or significant hepatocellular injury determined by bilirubin levels); or (6) pregnancy, nursing, or high risk of pregnancy.

Table 1
Demographic characteristics of patients.

Gender	
Male, N (%)	109 (65.3)
Female, N (%)	58 (34.7)
Race	
African American, N (%)	107 (46.1)
European American, 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)
Four-year college graduate, N (%)	12 (7.2)
Some graduate school, N (%)	14 (8.4)
Other, N (%)	1 (0.6)
Index trauma	
Non-sexual assault, N (%)	60 (35.9)
Sexual assault, N (%)	41 (24.6)
Seeing others injured or dying, N (%)	27 (16.2)
Combat, N (%)	19 (11.4)
Accident, N (%)	15 (9.0)
Other, N (%)	5 (3.0)

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

2.3. Measures

Participants were administered the following measures as part of a larger battery:

- The PTSD Symptom Severity Interview (PSS-I; Foa et al., 1993), a clinician rated interview that consists 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 2 weeks (0 = *not at all*, 3 = *5 or more times per week/very much*). Interrater reliability for PTSD diagnosis ($\kappa = .91$) and overall severity ($r = .97$) are excellent (Foa et al., 1993). In the current sample, the measure demonstrated adequate reliability, with Cronbach's $\alpha = .75$.
- 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. These cognitions are hypothesized to be associated with poor recovery from traumatic experiences as well as 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: negative cognitions about self (PTCI-Self; 21 items), negative cognitions about the world (PTCI-World; 7 items), and self-blame (PTCI-Blame; 5 items). The negative cognitions about self scale include items that assess 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 include items that assess 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 assess the extent to which the individual believes he or she is responsible for the occurrence of the trauma (e.g., "The event happened because of the way I acted"). These three subscales are intercorrelated ($rs = .57\text{--}.75$). The PTCI shows sound psychometric properties: internal consistency: $\alpha_{Total} = .97$, $\alpha_{Self} = .97$, $\alpha_{World} = .88$, and $\alpha_{Blame} = .86$; test-retest reliabilities, 1-week retest interval: $\rho_{Total} = .74$, $\rho_{Self} = .75$, $\rho_{World} = .89$, and $\rho_{Blame} = .89$, and 3-week retest interval: $\rho_{Total} = .85$, $\rho_{Self} = .86$, $\rho_{World} = .81$, and $\rho_{Blame} = .80$ (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, 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). In the current sample, the measure demonstrated excellent reliability: PTCI Negative Self subscale, Cronbach's $\alpha = .94$, PTCI Negative World subscale, $\alpha = .84$, PTCI Self Blame subscale, $\alpha = .74$,

- The Drinker Inventory of Consequences (DrInC; Miller, Tonigan, & Longabaugh, 1995), a self-administered 50-item questionnaire that examines 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 – with Pearson $r = .93$ for the full scale, and .92, .93, .96, .79, and .91 for the five subscales. Miller et al. (1995) found that the measure also has good internal consistency – $\alpha = .94$, .74, .80, .86, .70, and .85 for the total scale and subscales, respectively.
- The Penn Alcohol Craving Scale (PACS; Flannery, Volpicelli, & Pettinati, 1999) is a 5-item self-administered instrument for assessing 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 excellent reliability (Cronbach's $\alpha = .92$), high item-total correlations ($r^2 = .80\text{--}.92$), 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). In the current sample, the PACS demonstrated excellent reliability, with $\alpha = .91$.
- Standardized Trauma Interview (STI; Foa, Hembree, & Rothbaum, 2007), 94-item clinician-rated interview that assesses demographic information, and details about the trauma and post-traumatic reactions.

For more details about the methods and sample, see Foa and Williams (2010).

2.4. Statistical analysis

Correlations between all scales and subscales were assessed using Pearson Product Moment correlations. Black-white means were also compared using a two-tailed t-test and correlations were compared using a Fisher r-to-z test. Given that there were more than twice as many African Americans as European Americans in the current sample, regression analyses using the full sample with interaction terms between race and the PTCI subscales were not possible as there would have been insufficient power to detect differences between the races. Instead, the data was stratified according to race (African American versus European American) and separate hierarchical regression analyses were conducted for African and European American participants to predict adverse

consequences of AD and alcohol craving severity as a function of PTSD severity and trauma cognitions.

3. Results

3.1. First order correlations

Descriptive statistics for the full sample of African American participants and European American participants are presented in Table 2. Correlations for the African American and European American participants are presented in Table 3. Correlations were 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 measured by the DrInC.

Consistent with previous reports, the Negative Self, Negative World, and Self Blame subscales of the PTCI were significantly related to PTSD severity in European American participants. In contrast, only the Negative Self and Negative World subscales of the PTCI were significantly related to PTSD severity in the African American participants.

Regarding 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 African American participants but not in European Americans.

Correlations between the PTCI and adverse consequences of AD differed based on ethnic group. Similar to the full sample, DrInC total scores in the African American participants were significantly related to the Negative Self subscale of the PTCI. DrInC total scores were marginally related to the Self Blame subscale of the PTCI ($r = .21$, $p = .052$) and not related to the Negative World subscale of the PTCI. When evaluating the subscales of the DrInC in African American participants, all subscales of the DrInC (Physical, Interpersonal, Intrapersonal, Impulsive, and Social) were significantly related to the Negative Self subscale of the PTCI, the Impulsive and Social subscales of the DrInC were significantly related to Self Blame subscale of the PTCI, and no significant relationships were

Table 2
Means and standard deviations for measured variables.

Scale	Full sample		European American		African American		<i>t</i>
	Mean	SD	Mean	SD	Mean	SD	
PSS-I	28.38	8.26	29.02	7.97	27.91	8.50	0.78
PTCI-Self	3.70	1.35	3.73	1.24	3.60	1.37	0.52
PTCI-World	5.04	1.26	4.66	1.42	5.20	1.15	-2.45*
PTCI-Self-Blame	3.18	1.48	3.38	1.54	3.02	1.38	1.45**
PACS	18.12	7.12	19.27	5.95	17.66	7.55	1.33
DrInC-Total	29.89	10.81	31.80	9.45	28.43	11.67	1.72
DrInC-Physical	5.58	2.17	5.74	1.98	3.60	1.37	0.77
DrInC-Interpersonal	6.73	2.92	7.34	2.55	6.29	3.13	2.00*
DrInC-Intrapersonal	6.25	2.25	6.54	2.03	5.98	2.40	1.38
DrInC-Impulsive	6.62	2.89	6.96	2.83	6.41	3.00	1.04
DrInC-Social	4.72	2.30	5.23	1.99	4.35	2.45	2.15*

N ranged from 48 to 50 for European Americans and 107–90 for African Americans due to missing values.

PSS-I = Posttraumatic Symptom Scale-Interview Version; PTCI Self = Posttraumatic Cognitions Interview-Self subscale; PTCI World = Posttraumatic Cognitions Interview-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 Behaviors Consequences subscale.

* $p < .05$.

** $p < .01$.

Table 3
Correlations for measured variables.

	1	2	3	4	5	6	7	8	9	10	11
1. PSS-I	—	.59**	.46**	.16	.32**	.32**	.31**	.30**	.25*	.25*	.30**
2. PTCI-Self	.67**	—	.64**	.52**	.52**	.42**	.41**	.40**	.38**	.31**	.39**
3. PTCI-World	.59**	.72**	—	.31**	.26*	.20	.21*	.19	.15	.19	.13
4. PTCI-Self Blame	.27	.55**	.38**	—	.34**	.21	.14	.14	.18	.26*	.22*
5. PACS	.14	.11	.18	.05	—	.37**	.34**	.28**	.29**	.31**	.38**
6. DrInC	−.04	.14	.05	.25	.09	—	.86**	.92**	.83**	.85**	.89**
7. DrInC-Physical	−.07	−.01	−.02	.16	−.01	.81**	—	.71**	.70**	.69**	.71**
8. DrInC-Interpersonal	−.06	.17	.10	.15	.14	.89**	.67**	—	.73**	.74**	.80**
9. DrInC-Intrapersonal	−.09	.10	−.01	.08	.17	.83**	.62**	.78**	—	.53**	.72**
10. DrInC-Impulsive	−.05	.11	.03	.37*	−.06	.79**	.58**	.59**	.42**	—	.69**
11. DrInC-Social	.13	.20	.07	.21	.19	.83**	.55**	.67**	.68**	.58**	—

Correlations above the diagonal represent African Americans in the sample; correlations below the diagonal represent European Americans in the sample. There was some variability in the number of participants (N) in each analysis. PSS-I = Posttraumatic Symptom Scale-Interview Version; PTCI Self = Posttraumatic Cognitions Interview-Self subscale; PTCI World = Posttraumatic Cognitions Interview-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.

* $p < .05$.

** $p < .01$.

detected between the Negative World subscale of the PTCI and subscales of the DrInC.

With European American participants, DrInC total scores were significantly related to the Self Blame subscale of the PTCI only, and none of the subscales of the DrInC was associated with negative cognitions about the self or world. In contrast, the Impulsive subscale of the DrInC was significantly related to Self Blame subscale of the PTCI.

Two-tailed Fisher r-to-z transformations were calculated using these correlation coefficients to assess the significance of these ethnic differences. The following correlation coefficients were found to be significantly different: the relationship between the PSS-I and the DrInC scale ($Z = 2$, $p = 0.05$), the PSS-I and the DrInC Physical subscale ($Z = 2.12$, $p = 0.03$), the PSS-I and the DrInC Interpersonal subscale ($Z = 1.99$, $p = 0.05$), the PTCI Negative Self subscale and the PACS ($Z = 2.55$, $p = 0.01$), the PTCI Negative Self subscale and the DrInC Physical subscale ($Z = 2.38$, $p = 0.02$), the PACS and the DrInC physical subscale ($Z = 1.99$, $p = 0.05$), and the PACS and the DrInC impulsive subscale ($Z = 2.06$, $p = 0.04$).

3.2. T-tests

Several t-tests were conducted to examine black–white differences on measures of trauma cognitions, adverse consequences of AD, and alcohol cravings. There were no significant differences found between the groups on alcohol craving severity. Significant differences between the groups were detected on trauma cognitions and adverse consequences of AD. On average, African Americans had higher scores on the PTCI-Negative World subscale compared to European Americans. This difference was significant $t(143) = 2.45$, $p = .02$, and it represented a small-to-medium sized effect. On average, European Americans had higher scores on the DrInC Interpersonal Consequences subscale compared to African Americans. This difference was significant $t(114) = 2.00$, $p = .05$, and it represented a small-to-medium sized effect. Additionally, European Americans had higher scores on the DrInC Social Consequences subscale compared to African Americans. This difference was significant $t(114) = 2.15$, $p = .03$, and it represented a small-to-medium sized effect. These findings are shown in Table 2. Bonferroni corrections were not used as this would have been too conservative given the scales were highly correlated (Nakagawa, 2004).

3.3. Regression analyses

Hierarchical regression analyses were conducted to predict adverse consequences of AD and alcohol craving severity separately in

African American and European American participants as a function of PTSD severity and trauma cognitions. There were four predictors in the analyses that included the PSS-I, PTCI-Self, PTCI-World, and PTCI-Self Blame.¹ In both the prediction of adverse consequences of AD and the severity of alcohol cravings, PTSD severity (PSS-I scores) was entered as Block 1 and trauma cognitions (PTCI-Self, PTCI-World, and PTCI-Self Blame) were entered into Block 2. The results of the regression analyses are presented in Tables 4 and 5 for our African American sample. There were no significant findings for the European American sample.

As Table 4 demonstrates, PTSD severity did not account for a significant amount of the variance in adverse consequences of AD ($R^2 = .02$, $p = ns$). The subscales of the PTCI (Block 2) accounted for a significant amount of variance in adverse consequences of AD ($\Delta R^2 = .18$, $p = .013$). The final model accounted for approximately 20% of the total variance in adverse consequences of AD. Table 4 shows that only one of the three variables in Block 2 significantly predicted severity of adverse consequences of AD. In particular, PTCI-Negative Self was associated with significant predictive values in adverse consequences of AD ($\beta = .51$, $p < .01$) with increased trauma cognitions about the self being associated with more severe adverse consequences of AD.

As Table 5 demonstrates, PTSD severity did not account for a significant amount of the variance in alcohol craving severity ($R^2 = .04$, ns). The subscales of the PTCI (Block 2) accounted for a significant amount of variance in alcohol craving severity ($\Delta R^2 = .30$, $p < .001$). The final model accounted for approximately 33% of the total variance in alcohol craving severity. Table 5 shows that only one of the 3 variables in Block 2 significantly predicted alcohol craving severity. In particular, PTCI-Negative Self was associated with significant predictive value in alcohol craving severity ($\beta = .56$, $p < .01$) with increased negative cognitions about the self being associated with more severe alcohol cravings.

4. Discussion

To date, no studies have explored racial differences in the relationship between trauma cognitions and alcohol use. The purpose of the present study was to examine black–white differences in trauma cognitions and their relationship to symptoms of AD, including alcohol cravings and destructive drinking.

¹ We conducted correlations and one-way 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.

Table 4

Summary of hierarchical regression analysis for variables predicting consequences of drinking in African Americans (N = 85).

Variable	B	SE B	β
Step 1			
Constant	16.23	4.03	
PSS-I	0.43	0.14	0.32
Step 2			
Constant	17.43	5.79	
PSS-I	0.18	0.17	0.13
PTCI-Self	3.64	1.38	0.44*
PTCI-World	-1.42	1.31	-0.14
PTCI-Self Blame	0.03	0.98	0.00

Note. $R^2 = .11$ for Step 1; $\Delta R^2 = .10$ for Step 2 ($p = .03$).

* $p < .01$.

Results suggest that trauma cognitions are connected to overall PTSD severity, but in African Americans self-blame appears to be a less important factor. This illustrates that the way individuals think about their trauma may affect them differently based on racial identity. This is especially relevant given that past research suggests that African Americans appear to benefit less from receiving alcohol treatment than European or Hispanic Americans (Jacobson, Robinson, & Bluthenthal, 2007). Targeting specific types of trauma cognitions within dually diagnosed samples may be one way to improve alcohol treatment outcomes.

Our findings with the PTCI and Alcohol Craving Scale indicate that negative views about one's self and the world may lead to stronger alcohol cravings in African Americans than in European Americans, which could result in more drinking. A negative self-concept and self-blame are particularly strong indicators of these cravings.

The relationships between the PTCI subscales and adverse consequences of drinking also differed based on ethnic group. In African Americans, negative thoughts about one's self and self-blame about the trauma were connected to harmful patterns of drinking that impacted all areas of life broadly (Physical, Interpersonal, Intrapersonal, Impulsive, and Social areas on the DrInC). Whereas in European Americans, harmful patterns of drinking were connected to self-blame about the trauma, rather than poor negative thoughts about the self; and the result of drinking was more likely to take the form of impulsive behaviors.

In our dually diagnosed sample, black and white participants experienced equivalent cravings for alcohol, however, African Americans had more negative views about the world. This makes sense, considering the greater impact of prejudice and discrimination encountered by African Americans, and our findings support the idea that such attitudes may be cultural and not trauma-related. This is consistent with prior research that suggests African Americans have

lower expectations about the benevolence of the world in general (Poulin & Silver, 2008; Zoellner et al., 1999).

In terms of consequences of drinking, European Americans were more likely to report negative interpersonal and social consequences from drinking. The cause of this difference is not completely clear, but it may be related to our finding that in European Americans, harmful patterns of drinking were more likely to cause impulsive behaviors, and this may be resulting in greater social and interpersonal difficulty.

Multiple regression analyses showed that negative cognitions about the self predicted both alcohol craving and harmful patterns of drinking in African Americans; negative thoughts about the world, self-blame, or overall PTSD severity were not predictors. This suggests that PTSD interventions for African Americans may be most effective if they are focused on improving self-concept and self-esteem rather than self-blame surrounding the trauma.

Limitations of this study include the cross-sectional design and its reliance on self-report. Furthermore, a more equal number of African and European Americans would have allowed us to conduct a regression analysis with interaction terms between race and the PTCI subscales, which would be a more robust test of our hypotheses. Additionally findings of the study apply only to black and white Americans with comorbid PTSD and AD from a specific geographical area. Future studies should continue to explore differences in trauma cognitions in other ethnic groups in various settings, to inform the treatment of other individuals with comorbid PTSD and AD.

5. Conclusion

This study highlights of some important racial differences in trauma cognitions and their relationship to symptoms of alcohol dependence. Perhaps the most noteworthy implication involves the findings suggesting that interventions targeting trauma-related cognitions in a sample with comorbid PTSD and AD are likely to have a greater impact on decreasing alcohol craving intensity and adverse consequences of alcohol abuse among African Americans than among European Americans. Additional research is needed to ascertain what variables would most significantly impact alcohol cravings and adverse consequences of alcohol abuse among European Americans and other ethnic groups.

This study underscores the continuing need to research and refine current treatment modalities that will provide diverse populations effective treatments in the presence of comorbidity. It is critical that future studies continue to explore the impact of trauma cognitions on symptoms of AD and evaluate the efficacy of differentially targeting trauma cognitions that may vary based on racial group to determine patient outcomes regarding the severity of PTSD, alcohol cravings, and adverse consequences of AD. Additionally, future research should work toward identifying other factors that influence the severity of PTSD, alcohol cravings, and adverse consequences of AD in a dually-diagnosed sample. Finally, future studies might use differential item functioning analyses based on item response theory to identify PTCI items that are more likely to be predictive of dysfunction in individuals of a particular racial group.

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Contributors

Monnica Williams planned the manuscript and analyses for this paper. Nuwan Jayawickreme conducted the statistical analysis and wrote the results. Monnica Williams, Nuwan Jayawickreme, and Rosanna Sposato conducted literature searches and drafted the final manuscript. Edna B. Foa designed the study from which the data were taken and contributed conceptual and editing assistance. All authors contributed to and have approved the final manuscript.

Table 5

Summary of hierarchical regression analysis for variables predicting alcohol cravings in African Americans (N = 95).

Variable	B	SE B	β
Step 1			
Constant	10.48	2.55	
PSS-I	0.26	0.09	0.30
Step 2			
Constant	9.26	3.46	
PSS-I	0.02	0.10	0.02
PTCI-Self	2.95	0.81	0.53*
PTCI-World	-0.82	0.77	-0.13
PTCI-Self Blame	0.53	0.58	0.10

Note. $R^2 = .09$ for Step 1; $\Delta R^2 = .19$ for Step 2 ($p = .000$).

* $p = .000$.

Conflict of Interest

All authors declare that they have no conflicts of interest.

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