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The Relationship Between Posttraumatic Stress Disorder and Race-Based Traumatic Stress

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Objective: This study examined the relationships between race-based traumatic stress symptoms (RBTSS), posttraumatic stress disorder (PTSD) symptoms, and negative affect (NA) in the past year. ***Method:*** Participants were 185 community-based respondents who completed a paper and pencil survey of the race-based traumatic stress symptoms scale (RBTSSS), diagnostic and statistical manual (DSM)-related PTSD symptoms, and negative emotions. ***Results:*** Two canonical correlation analyses were conducted for two participant groups: those with no race-based traumatic stress (RBTS) elevations and those with one or more RBTS elevations. Results showed a significant relationship between RBTS symptoms and PTSD symptoms for the no elevation group, and a significant relationship between RBTS symptoms and NA for the race-based stress/traumatic stress group. Notably, RBTS inclusion was not significantly correlated with NA. ***Conclusions:*** Those with average-level RBTS symptoms appear to endorse more PTSD criteria, while those with elevated RBTS scores do not. The study, therefore, highlights the need for further investigation of how diagnostic measures of trauma may differentiate from trauma symptoms related to race-based experiences.

Clinical Impact Statement
Understanding the psychological effects of racism is now being understood within the context of trauma, both in regard to posttraumatic stress disorder (PTSD) and race-based trauma as emotional injury. This study suggests that the relationship between race-based traumatic stress (RBTS) and trauma might be associated with the level of RBTS symptoms exhibited. Higher scores of RBTS symptoms were associated with negative emotions and not with PTSD symptoms. Therefore, given the complex manner in which RBTS symptoms can present, clinicians are encouraged to routinely undertake an assessment of racial trauma as part of a standard intake procedure.

Keywords: trauma, symptoms, racism, negative affect

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Scholars have noted that in the course of one's life, many people experience events that are considered adverse and stressful (Bonanno & Mancini, 2012; Butts, 2002; Carter & Pieterse, 2020). Despite this, people respond to these stressful experiences in a variety of ways. For instance, some people may encounter stressful experiences that impede their ability to function for years, while others may experience few, if any, adverse reactions to the event. Adverse race-based experiences function similarly, with some people having minimal to no reactions while others report these experiences as being stressful and profoundly harmful to them (e.g., Carter et al., 2019; Hill et al., 2018; Williams, Printz, & DeLapp, 2018). Specifically, researchers have found that in some cases, a person may have a severe stress reaction to a race-based experience resulting in trauma-related symptoms and increased negative affectivity (Carter, Kirkinis, & Johnson, 2020; Carter, Roberson, & Johnson, 2020; Helms et al., 2012; Johnson et al., 2023; Roberson & Carter, 2022; Williams, Kanter, & Ching, 2018). Currently, the diagnostic and statistical manual (DSM) and international classification of diseases (ICD) diagnosis of posttraumatic stress disorder (PTSD) represent the accepted manner in which psychologists, and clinicians more broadly, can assess for severe stress reactions to negative life events such as experiences of racism. Given the rise in recognition of adverse race-based experiences as potential triggers of traumatic stress symptoms, there remains a need to determine if and how the PTSD

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The data presented in the current manuscript are a subset drawn from a large RBTSSS date set of N-1400, using those who took the PTSD and Negative Affect scales. The current data ($N = 185$) utilizing the RBTSSS, PCL-C-17, and PANAS-X have not been utilized in any prior studies.

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diagnosis captures race-based traumatic stress (RBTS). The current study examines the extent to which traumatic stress reactions to race-based experiences overlap with PTSD as operationalized in the DSM and negative affect, a strong correlate of PTSD.

RBTS

Despite the well-documented adverse health effects of racism and racial discrimination (Carter et al., 2019; Kirkinis et al., 2021; Paradies et al., 2015), racism has not been widely considered as a potential stressor that can result in trauma in the mental health research literature. As noted by Carter (2007), even when race-related stress has been studied, trauma was rarely considered as a possible outcome. The overlooked role of race-related stress as a potential precursor to trauma is particularly important given the higher rates of trauma (PTSD) observed among people of color compared to the general population, and Whites, specifically. For instance, it has been estimated that while the lifetime prevalence of PTSD falls between 5% and 39% for the overall population, prevalence rates among people of color exceed these figures (Breslau, 2001; Carter & Pieterse, 2020). Additionally, in a nationally based population study examining racial/ethnic variation and trauma-related psychopathology, Black Americans evidenced a greater likelihood of developing PTSD subsequent to a trauma exposure (McLaughlin et al., 2019).

These gaps appear to be unexplained by the amount of exposure to stressful life events between people of color and White people (Carter & Pieterse, 2020; Mekawi et al., 2021; Norris, 1992; Pole et al., 2005, 2008; Roberts et al., 2011) or by covariates that may differ by racial group, including sociocultural differences in social support systems that can serve as a potential buffer against trauma (Fortuna et al., 2008), acculturation differences in the reporting of symptoms (Orlando & Marshall, 2002), and differences in underlying risk and protective factors including socioeconomic status, education, and comorbid psychiatric disorders (McClendon et al., 2021; Roberts et al., 2011). Therefore, people of color may experience more severe psychological and emotional symptoms associated with traumatic events (McClendon et al., 2021; Vin-Raviv et al., 2013) and/or may experience unique forms of stress or trauma than Whites, including race-related stress and trauma (Bryant-Davis & Ocampo, 2006; Carter et al., 2019; Williams, Kanter, & Ching, 2018).

The idea that race and racism could be implicated in the experience of trauma is supported by emerging evidence from the empirical literature. To illustrate, Pieterse et al. (2010) found that in a sample of college students, perceptions of racial discrimination predicted trauma-related symptoms over and above general life stress for Black students and perceptions of a negative racial climate contributed to the variance in trauma symptoms for Asian students above general life stress. This finding has been supported by other research providing evidence that exposure to race-related stress can yield symptoms reflective of trauma reactions (see Carter & Sant-Barket, 2015, 2019; Chou et al., 2012). Mekawi et al. (2021) found that Black women's experiences of racial discrimination were associated with more severe PTSD symptoms. Similarly, Williams, Kanter, and Ching (2018) found that various assessments of racial discrimination (e.g., racial microaggressions, everyday discrimination) were positively associated with trauma symptoms in samples of students of color (Williams, Metzger, et al., 2018).

Given that *racism* refers broadly to not only racial prejudice or animus perpetrated against individuals but also cultural and institutional manifestations of racial oppression, the term is typically reserved for people of color that have been historically marginalized or minoritized in the United States. However, White Americans also perceive experiences of unfair treatment and discrimination as race based. Lee et al. (2019) found that 2% of White participants (compared to 14% of participants of color) reported experiencing discrimination or unfair treatment based on race *regularly*. When asked about *occasional* racial discrimination experiences, White participants reported racial discrimination at about half the rate (26%) of participants of color (58%). Therefore, the investigation of RBTS among White people continues to be an important area of inquiry (Carter, Roberson, & Johnson, 2020).

Carter (2007) proposed that race-based experiences could result in traumatic stress and grounded this assertion in the extant empirical literature on racial discrimination, PTSD, race-related stress, and stressful life events (Carter & Pieterse, 2020). More specifically, Carter (2007) identified RBTS as a *severe* and unique reaction to a race-based experience, specifically an experience that was outside of the person's control, was sudden, and was experienced as emotionally painful (Carter et al., 2019). He acknowledged that like other stressful experiences, not all adverse race-based experiences would result in a severe stress reaction. Additionally, Carter asserted that RBTS could result in similar symptomatology as other forms of trauma and possibly has some overlapping symptoms with PTSD (e.g., dissociation and depression).

Recent empirical work with the Race-Based Traumatic Stress Symptom Scale (RBTSSS) has provided support for Carter's (2007) assertions regarding both the overlapping of RBTS symptoms and other forms of trauma, as well as the variability with which a person may respond to race-based stressors. Specifically, studies have found that RBTS symptoms of depression, hypervigilance, and low self-esteem are positively related to general trauma symptoms (Carter, Kirkinis, & Johnson, 2020; Carter, Roberson, & Johnson, 2020). In other studies, researchers have found that both White and Black participants who appear to have average or below average scores on RBTS symptom scores (i.e., "no stress" group) appeared to differ significantly from those who had above average scores on specific symptoms ("stress" group). For White participants, intrusive symptoms (e.g., nightmares) were significantly higher in the "stress" group, compared to the "no stress" group. For Black participants, the "stress" group had higher scores on a wider range of symptoms including depression, intrusion, anger, hypervigilance, and physical symptoms (Carter & Kirkinis, 2021).

PTSD and Negative Affect

Although the extant literature provides valuable insight into relationships between racism or racial discrimination and trauma, as well as the relationships between RBTS and general trauma symptoms, there appears to be few investigations of the overlap between RBTS and PTSD diagnostic criteria. One notable exception is Williams, Printz, and DeLapp (2018) exploration of the psychometric properties of the Trauma Symptoms of Discrimination Scale (TSDS). The authors found that the Posttraumatic Diagnostic Scale (PDS), a diagnostic measure of PTSD, was positively correlated with the TSDS, a measure of anxiety-related trauma symptoms resulting from experiences of discrimination. However, the authors did not explore the degree to which the PDS converged with specific

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symptoms within the TSDS, limiting the ability to determine to what degree these measures overlapped.

As scholars have previously recognized (Bryant-Davis, 2007; Carter, 2007; Williams, Metzger, et al., 2018), the factors related to the development of PTSD appear to also exist for those who experience adverse race-based experiences. Specifically, researchers have found that the development of PTSD appears to be higher for those who encounter stressful events that alter the way a person sees themselves and the way the person views the world (Bryant & Guthrie, 2005). These alterations appear to manifest in feelings of shame, self-doubt, and global feelings that the world may be an unsafe place. In the case of instances of racism, individuals often wonder if they contributed to negative experience or could have prevented the incident, and scholars have linked these experiences to resulting low self-esteem and shame (Kim et al., 2016; Mereish et al., 2016). Similar to other potentially traumatizing experiences, race-based experiences appear to influence the way a person thinks about the world, leading some to anticipate more discrimination in the future (Constante et al., 2021).

Negative affect, or the degree and intensity with which a person experiences negative emotions (e.g., shame), is also considered a major factor contributing to the development of diagnosable PTSD and commonly comorbid diagnoses (e.g., major depressive disorder; Byllesby et al., 2016). Researchers have found that the resulting intensity of PTSD symptoms is significantly associated with negative affectivity (Vujanovic et al., 2013). Some scholars suggest that higher negative affectivity is a risk factor for the development of PTSD (Miller, 2003), yet others have found that in the case of racial trauma, negative affect does not explain the relationship between exposure to adverse race-based events and resulting trauma symptoms (Williams, Kanter, & Ching, 2018). As such, the focus of our investigation was to examine overlapping symptoms between RBTS as a variable set and PTSD and negative affect as a variable set, rather than determine the extent to which negative affect had explanatory power in the relationship between exposure to discrimination and mental health outcomes as Williams, Kanter, and Ching (2018) have done.

The Current Study

The current study was designed to investigate the extent to which RBTS symptoms overlap with PTSD symptoms and the past year negative affect in a cross-racial sample of American adults who have varying levels of RBTS symptoms. Given prior research, we expected to find an association between RBTS symptoms as one set of variables and PTSD symptoms and negative affect as a second set of variables. Acknowledging that negative affect is associated with exposure to stressful experiences, even for those experiences not deemed to be severe or traumatic, we expected a relationship between RBTS symptoms and negative affect to emerge for those with low or average-level RBTS symptoms.

Method

Participants

The current data utilize a subset of data from the RBTSSS validity study (Carter & Muchow, 2017) which included roughly 1,100 participants recruited across various community sites including barber shops/salons, behavioral health service agencies, and colleges/universities who completed a paper and pencil survey packet including the RBTSSS and other measures of trauma symptoms and emotions. Institutional Review Board approval granted to the PI of the RBTSSS validity study included approval to utilize this large dataset for projects that broadly examined the relationships between RBTSS and associated psychological, emotional, and trauma outcomes. Participants from the RBTSSS validity study who had taken the PTSD Checklist - Civilian Versions and Positive and Negative Affect Scale (PANAS-X) were included in the current study, making up a total of 187 participants. Within the current study, participants' ages ranged from 17 to 72 ($M = 39.17$, $SD = 12.56$). The sample is comprised of 85 (45.9%) women and 100 (54.1%) men, with two participants not responding to this item. Of the total participants, 101 (54%) identified as Black/African–American, 50 (26.7%) as White, 25 (13.4%) as Latinx, and seven (3.7%) as biracial. Four participants reported their racial designation as "other." The average education level of participants in the sample was 12.77 years ($SD = 3.27$), with a range of 1–21 years. Participants' self-reported socioeconomic status was as follows: lower class: 42 (22.5%), working class: 58 (31%), middle class: 68 (36.4%), upper middle class: 49 (7.9%), upper class: 11 (5.9%), and eight (4.3%) participants did not answer this item. Participant religious group membership included: Catholic: 54 (28.9%), Christian: 81 (38.1%), Jewish: two (1.1%), Muslim: 14 (7.5%), Hindu: two (1.1%), none: 15 (8.0%), other: 15 (8.0%), and four (0.2%) participants did not report their religious group membership.

Measures

Posttraumatic Stress Disorder Checklist-Civilian (PCL-C-17; Weathers et al., 1993): The PCL-C-17 is a standardized self-report scale designed to assess posttraumatic stress disorder symptoms in civilian populations. The measure asks respondents about their responses to "a stressful experience from the past" in the past month using a 5-point Likert scale (1 "*not at all*" to 5 "*extremely*"). Response 3 (*moderately*) and above are considered as symptomatic. A total score is obtained by summing the responses across the 17 items. Studies have shown that the PCL is a reliable measure of PTSD symptomatology for racially diverse populations (e.g., $\alpha = .85$, Cook et al., 2005; $\alpha = .94$, Mueser et al., 2001). Validity evidence for the PCL was presented by Keen et al. (2008), including Cronbach's alpha of .94 and convergent validity, demonstrated by strong correlations with the clinical administered PTSD scale ($r = .79$). For the current study, internal consistency as measured by Cronbach's alpha was $\alpha = .95$ ($M = 37.30$ and $SD = 16.92$).

The Positive and Negative Affect Scale (PANAS-X; Watson et al., 1988): Participants rated the extent to which they experienced 60 positive and negative emotion items on a 5-point Likert-type scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*) over the past year. The positive affect subscale of the PANAS-X is the average rating of 10 emotion items (active, alert, attentive, determined, enthusiastic, excited, inspired, interested, proud, and strong). The negative affect subscale is the average rating of 10 emotions (afraid, scared, nervous, jittery, irritable, hostile, guilty, ashamed, upset, and distressed). Higher scores indicate greater levels of affect over the past year. The PANAS-X has good psychometric properties with evidence of construct validity as assessed by confirmatory factor analysis found across racial groups (Mertz et al., 2013; Tuccitto et al., 2010). Only the negative affect scale was used in the current study, with a Cronbach's $\alpha = .89$ ($M = 22.71$, $SD = 9.72$).

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Race-Based Traumatic Stress Symptom Scale (RBTSSS, Carter et al., 2013): The RBTSSS is a 52-item questionnaire in which participants describe three memorable events of racism they have had in their lives. Participants are asked to select the most memorable event and use it to answer whether the incident was negative (i.e., emotionally painful), out of your control, and sudden in its occurrence (yes/no). Participants then go on to complete symptom-specific items, where they select the extent to which a symptom affected them right *after the event* (within one month), *more recently* when thinking about the event, and if others noticed a change in the person's behavior as a result of the reaction. Examples of reaction items include "As a consequence of the memorable encounter I had with racism I felt sad" and "As a consequence of the memorable encounter I had with racism, I experienced tiredness and lack of energy." Respondents use a 5-point Likert scale to respond to *immediately after* and *recent* items, and "*yes or no*" to the others noticed items. High scores indicate a greater presence of the given reaction. In the current sample only the immediately *After* reactions were used with Cronbach's alpha coefficients as: depression (10 items; $\alpha = .91$), intrusion (eight items; $\alpha = .89$), anger (eight items; $\alpha = .91$), hypervigilance (eight items; $\alpha = .92$), physical reactions (eight items; $\alpha = .92$), low self-esteem (six items; $\alpha = .93$), and avoidance (four items; $\alpha = .81$).

Results

To examine the distribution of the scores on variables of interest, descriptive statistics were conducted on all participants. These results can be found in Table 1 for PTSD (PCL-C-17) scores, RBTSSS scores, and the Negative Affect scale of the PANAS-X. Bivariate correlations for the full sample on all study variables are provided in Table 2.

Preliminary Analyses

To test for significant racial group differences in RBTSS, PTSD, and negative affect, multivariate analyses of variance were conducted. Race was the independent variable, and the dependent variables included the seven RBTS symptom scales *Immediately after* the event (e.g., avoidance, intrusion, and depression), the single total score of the PCL-C-17, and the negative affect total score. Due to the small sizes of some racial groups, race was collapsed into three categories: White ($n = 52$), Black ($n = 101$), and other people of color ($n = 32$). To account for the use of a three-level independent variable (i.e., the three collapsed racial groups), we used a Bonferroni correction to prevent the risk of Type 1 error ($p < .016$).

The omnibus test revealed that the overall model was statistically significant, Wilks's $\lambda = .763$, $F(20, 342) = 2.472$, $p = .001$, with racial differences across scores only noted for PTSD ($p = .001$). An examination of the mean scores for the PTSD measure indicated that Whites had the highest PTSD scores ($M = 48.66$, $SD = 15.06$) followed by other people of color ($M = 39.96$, $SD = 16.46$), and Blacks ($M = 34.92$, $SD = 16.47$). No significant differences at the $p = .001$ level were found for RBTSSS scales or negative affect scores.

Using the scoring procedure for the RBTSSS created by Carter and Sant-Barket (2015), the raw scores of the RBTSSS subscales were summed (e.g., depression = 16) and converted to standard scores by first calculating *z*-scores and then *t*-scores. To calculate subscale standard scores for each participant, the sample's mean and standard deviation for each scale are calculated, for example, M (depression) = 4.66, SD (depression) = 6.46, z (depression) = 16–4.66/6.46 = 1.76. To convert the *z*-scores to *t*-scores (where $M = 50$, $SD = 10$), the *z*-score is multiplied by 10, and then 50 is added to the result (e.g., $(1.76 \times 10) + 50 =$ depression *t*-score = 68). According to Carter and Sant-Barket (2015), when participants

Table 1
Descriptive Variables for Study Variable by Stress Versus No Stress Group and Racial Designation

	No stress group ($N = 109$)		
Variable	Black ($N = 61$)	POC ($N = 21$)	White ($N = 21$)
1. RBTSS depression	$M = 4.68$, $SD = 5.53$	$M = 6.71$, $SD = 5.33$	$M = 6.46$, $SD = 6.39$
2. RBTSS intrusion	$M = 6.54$, $SD = 5.31$	$M = 7.04$, $SD = 5.45$	$M = 7.38$, $SD = 5.99$
3. RBTSS anger	$M = 6.48$, $SD = 5.15$	$M = 6.67$, $SD = 4.36$	$M = 9.61$, $SD = 6.14$
4. RBTSS hypervigilance	$M = 3.31$, $SD = 4.26$	$M = 5.57$, $SD = 5.34$	$M = 6.42$, $SD = 5.13$
5. RBTSS physical	$M = 3.86$, $SD = 4.28$	$M = 4.90$, $SD = 4.57$	$M = 6.41$, $SD = 5.62$
6. RBTSS low self-esteem	$M = 1.70$, $SD = 2.72$	$M = 3.09$, $SD = 3.78$	$M = 3.19$, $SD = 3.75$
7. RBTSS avoidance	$M = 1.68$, $SD = 2.16$	$M = 2.33$, $SD = 2.51$	$M = 2.88$, $SD = 3.08$
8. PTSD	$M = 24.33$, $SD = 6.14$	$M = 27.41$, $SD = 7.08$	$M = 24.83$, $SD = 9.35$
9. PANAS: negative affect	$M = 28.86$, $SD = 12.76$	$M = 30.47$, $SD = 11.56$	$M = 46.10$, $SD = 18.07$
	Stress/trauma group ($N = 76$)		
Variable	Black ($N = 40$)	POC ($N = 13$)	White ($N = 23$)
1. RBTSS depression	$M = 16.57$, $SD = 9.91$	$M = 20.54$, $SD = 5.44$	$M = 19.61$, $SD = 8.96$
2. RBTSS intrusion	$M = 17.10$, $SD = 6.38$	$M = 19.63$, $SD = 6.08$	$M = 19.43$, $SD = 6.17$
3. RBTSS anger	$M = 19.13$, $SD = 5.58$	$M = 19.54$, $SD = 5.50$	$M = 20.47$, $SD = 7.12$
4. RBTSS hypervigilance	$M = 13.10$, $SD = 7.61$	$M = 17.73$, $SD = 3.95$	$M = 17.30$, $SD = 8.07$
5. RBTSS physical	$M = 14.17$, $SD = 6.87$	$M = 18.36$, $SD = 5.18$	$M = 15.86$, $SD = 6.47$
6. RBTSS low self-esteem	$M = 7.95$, $SD = 6.74$	$M = 13.63$, $SD = 2.51$	$M = 11.13$, $SD = 6.25$
7. RBTSS avoidance	$M = 5.82$, $SD = 4.12$	$M = 8.54$, $SD = 3.41$	$M = 7.65$, $SD = 4.01$
8. PTSD	$M = 27.81$, $SD = 6.18$	$M = 27.64$, $SD = 7.46$	$M = 27.50$, $SD = 6.32$
9. PANAS: negative affect	$M = 41.97$, $SD = 18.12$	$M = 52.09$, $SD = 12.46$	$M = 53.20$, $SD = 11.37$

Note. RBTSS = race-based traumatic stress symptoms; PTSD = post-traumatic stress disorder; PANAS = positive and negative affect scale; POC = People of Color.

Table 2
Correlations of Study Variables for Full Sample

Variable	1	2	3	4	5	6	7	8	9
1. RBTSS depression									
2. RBTSS intrusion	.747**								
3. RBTSS anger	.725**	.817**							
4. RBTSS hypervigilance	.853**	.811**	.747**						
5. RBTSS physical	.817**	.797**	.847**	.857**					
6. RBTSS low self-esteem	.842**	.701**	.841**	.841**	.795**				
7. RBTSS avoidance	.783**	.612**	.783**	.783**	.765**				
8. PTSD	.451**	.444**	.473**	.530**	.468**	.484**	.458**		
9. PANAS: negative affect	.370**	.251**	.184*	.348**	.328**	.342**	.339**	.423**	1

Note. RBTSS = race-based traumatic stress; PTSD = posttraumatic stress disorder; PANAS = positive and negative affect scale.
* Correlation is significant at the .05 level (two-tailed). ** Correlation is significant at the .01 level (two-tailed) ($N = 185$).

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reported that their most memorable event was (a) emotionally painful (negative), (b) sudden, and (c) out of the person's control, their RBTSS score elevations were reflective of a stress-trauma response. *T*-scores of 60 or above (i.e., one standard deviation above the mean) are considered elevated, where one or more elevated RBTSSS scores indicate race-based stress and three or more elevated RBTSSS scores indicate RBTS.

In the current sample, 109 (58.8%) participants fell into the "no race-based stress" group, 30 (16.0%) participants met the criteria for the "race-based stress" group, and 47 (25.1%) participants met the criteria for the "race-based traumatic stress" group. These three groups (described below) were used in the main analyses of this study.

No RBTS-Stress Group

The no RBTS-stress group (i.e., no elevations) consisted of 109 participants. Age ranged from 17 to 72 ($M = 39.71$, $SD = 13.35$) and this group was comparable in educational level, racial, gender, religious, age, and class make-up to the full sample.

Race-Based Stress Group

The race-based stress group (i.e., 1–2 scale elevations) consisted of 31 participants. Ages ranged from 22 to 62 ($M = 36.62$, $SD = 11.75$); this group did not vary significantly from the demographic characteristics of the full sample.

RBTS Group

The RBTS group consisted of 47 participants with ages ranging from 21 to 59 ($M = 39.51$, $SD = 11.09$); this group also did not vary significantly from the demographic characteristics of the full sample.

Main Analysis

In order to examine the relationships between the RBTS symptoms, PTSD symptoms and negative affect, and more specifically, to determine whether PTSD and negative affect are associated with specific RBTS reactions, we conducted two canonical correlation analyses (CCA). This analysis was chosen for two main reasons: (a) CCA is designed to test the association between two variable sets (i.e., race-based trauma stress symptoms and emotional and traumatic symptoms), and (b) CCA protects against Type I error, allowing for multiple independent and dependent variables to be analyzed together (Sherry & Henson, 2005). Although an a priori power analysis was not conducted, the sample size for the analyses was considered adequate based on the number of cases per variable guidelines for multivariate procedures such as CCA (Siddiqui, 2013).

One CCA was conducted for participants who fell into the "no race-based stress" group ($n = 109$). Another CCA was conducted for participants who fell into either the "race-based stress" or "race-based traumatic stress" groups ($n = 78$). Total scores from the PCL-C-17 and PANAS-X negative affect scale served as the predictor variable set, while the seven *Immediately* after RBTSS scales served as the criterion variable set. A criterion of 0.45 was used as a cutoff score to interpret significant canonical roots (Sherry & Henson, 2005).

No Race-Based Stress Group

For the "no race-based stress" group (no scale elevations), the CCA yielded one statistically significant function, Wilks's $\lambda = .665$, $F(14, 194) = 3.12$, $p = .001$, with a squared canonical correlation (R_c^2) of 0.279. Therefore, the function accounted for 27.9% of the variability in predictor and criterion variable sets. Looking at the Function 1 coefficient (Table 3), the relevant ($h^2 > 45\%$) variable in the predictor variable set was PTSD symptoms and relevant variables in the criterion variable set included hypervigilance, followed by anger, physical symptoms, avoidance, low self-esteem, depression, and intrusion. All relevant variables had positive signs, indicating that all of the RBTS symptom scales were positively related to one another, and PTSD symptoms.

The findings of the CCA indicate a unique variate was created between RBTS symptoms and the PTSD total score but not negative affect. Thus, we found that all of the RBTS symptom scores were associated with PTSD within the "no race-based stress" group.

Race-Based Stress and Traumatic Stress Groups

For the combined Race-Based Stress/Traumatic Stress groups, in which at least one RBTS symptom score was elevated for each participant, the CCA yielded one significant function, Wilks's $\lambda = .616$, $F(14, 140) = 2.731$, $p = .001$, with a squared canonical correlation of (R_c^2) of 0.30. Therefore, the function accounted for 30% of the variability in predictor and criterion variable sets. Looking at the Function

Table 3
Canonical Solution for PTSD and Negative Affect Predicting Race-Based Traumatic Stress Groups

Variable	No stress group			Stress/trauma group		
	Coefficient	R_s	R_s^2(%)	Coefficient	R_s	R_s^2 (%)
Depression	−.20	*.601*	36.00	.75	*.78*	**60.84**
Anger	.51	*.790*	**64.41**	−.72	−.05	25.00
Physical symptoms	.005	*.728*	**52.99**	*.72*	*.69*	**47.61**
Low self-esteem	.72	*.719*	**50.41**	*−.49*	*.57*	32.49
Avoidance	.78	*.713*	**50.83**	.14	*.48*	23.04
Hypervigilance	.77	*.924*	**84.64**	.06	*.66*	43.56
Intrusion	−.32	*.474*	22.46	.13	.38	14.44
R_c^2			33.0			38.0
PANAS: negative affect	.017	.26	36.0	1.16	*.951*	**90.44**
PCL-17: PTSD	.995	*.99*	**98.0**	−.37	*.277*	**76.72**

Note. Structure coefficients (R_s) greater than .45 are italicized. Communality coefficients (H^2) greater than 45% are bolded. Coef = standardized canonical function coefficient; R_s = structure coefficient; R_c^2 = squared structure coefficient; H^2 = communality coefficient; PTSD = post-traumatic stress disorder; PANAS = positive and negative affect scale; PCL-17 = PTSD Checklist - Civilian Versions.

1 coefficients (Table 3), the relevant ($h^2 > 45\%$) variable in the predictor variable set was negative affect and relevant variables in the criterion variable set included depression, followed by physical symptoms, hypervigilance, low self-esteem, and avoidance. All relevant variables had positive signs, indicating that all of the RBTS symptom scales were positively related to one another, and to negative affect.

Discussion

Carter (2007) posited that racial encounters can result in RBTS and resulting empirical studies have provided support for this assertion (Carter et al., 2013 ; Carter & Muchow, 2017; Carter & Sant-Barket, 2015). The current study sought to explore the extent to which RBTS symptoms overlapped with diagnostic criteria for PTSD and for reports of negative affect, given its strong relation to PTSD. Results of the study revealed that the RBTS scores of participants who fell into the "no race-based stress" group (i.e., no elevated RBTS scores) were associated with PTSD symptoms, while the RBTS scores of participants who fell into the "race-based stress" or "race-based traumatic stress" groups (i.e., one or more elevations on RBTS symptoms) were associated with negative affect, but not PTSD.

Carter (2007) and Carter and Pieterse (2020) have discussed the limitations of the PTSD diagnostic criteria, particularly that an experience must be life-threatening in order to be considered a possible trigger of PTSD. Still, it remains important to consider where RBTS symptoms overlap with PTSD diagnostic criteria given that clinicians are widely, and in many cases exclusively, trained to assess for trauma using DSM and ICD criteria and the RBTSSS includes experiences that may not be life-threatening but are emotionally painful. Findings from the current study suggest a complex relationship between RBTSS and PTSD and negative affect, influenced by the level of RBTS symptom severity. For those with mean or no elevated levels of RBTS symptoms, PTSD criteria appear to be somewhat associated with all seven RBTS symptoms. Clinically, this suggests that those with average levels of RBTS symptoms may more readily endorse and fit into the diagnostic criteria of PTSD (e.g., hyperarousal, avoidance, intrusion). However, those with elevated RBTS scores appeared to more readily endorse negative emotions, but not PTSD. This finding was somewhat surprising, considering that the RBTSSS taps into similar symptoms as the PTSD diagnostic criteria (i.e., hyperarousal, intrusive symptoms, and avoidance) and therefore we may expect those with higher RBTS scores to more readily endorse PTSD criteria. However, examination of the RBTS scores that were most associated with PTSD in the "no race-based stress" groups, and negative emotions in the "race-based stress" and "race-based traumatic stress" groups offer some possible explanations.

First, all seven RBTS scores in the "no race-based stress" groups were associated with PTSD criteria. This finding might suggest that despite having mean-level scores, endorsement of a wider constellation of RBTS scores will lead to more endorsement of PTSD. This finding makes sense given that the PCL-C-17 assesses for the presence of major associated domains of trauma including hyperarousal, intrusion, avoidance, negative alterations in mood and cognitions, and intrusion symptoms. Thus, a wider range of these symptoms related to race-based experiences will also create a more solid picture of PTSD. Notably, intrusion and avoidance were not strongly related symptoms for the "no race-based stress" group. This finding makes sense in the context of race-based experiences (compared to nonrace-based experiences) because it may be easier to avoid trigger situations and individuals when suffering from trauma associated with sexual abuse and natural disasters, whereas the ability to avoid triggering racial situations is much more difficult considering one may be reminded of the incident in a variety of daily activities including work, school, and social situations (Swim et al., 2003). Further, the presence of hypervigilance and anger as the most strongly associated RBTS symptoms may further underscore the limited reactions individuals have in the wake of race-based trauma, including become hyperalert to possible adverse racial stimuli and the reasonable frustration when these incidents cannot be avoided.

Conversely, the "race-based stress" and "race-based traumatic stress" groups' RBTS scores (i.e., depression, physical symptoms, hypervigilance, low self-esteem, and avoidance) were associated with negative affectivity, but with no contributions from anger and intrusion. Thus, one could argue that not all the core reactions of trauma are involved in the relationships with negative affect. As such, participants meeting the criteria for RBTS may include those

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who are feeling afraid and scared, nervous and jittery, irritable or hostile, guilty and shamed, along with also experiencing depression, physical pains and aches, a sense of worthlessness and withdrawal. It should be pointed out that RBTS does not in this instance, look like traditional PTSD, specifically because a person may not meet the criteria for the core reaction of intrusion. Therefore, a novel finding of this study is that while a person may meet criteria for RBTS, they may not necessarily meet the criteria for PTSD.

Racial trauma researchers' main criticism of diagnostic criteria for PTSD is that the diagnosis is limited to those who have experienced a life-threatening event or threat of serious injury or sexual violence (Carter, 2007; Williams, Metzger, et al., 2018). The findings of this study highlight an additional limitation of current diagnostic criteria for PTSD; the diagnosis does not consider how an emotionally painful event may produce many traumatic stress reactions but does not include the core traumatic reaction of intrusion. Although intrusive symptoms (e.g., nightmares and flashbacks) may be one of the most readily recognized symptoms of PTSD, it appears that this symptom domain is absent or not as pronounced in some cases of RBTS. In thinking about the frequent, often confusing and sometimes subtle nature of race-based experiences, it is possible that intrusion symptoms related to race-based experiences may not manifest as frank nightmares or flashbacks or be considered "disturbing," as some diagnostic measures of PTSD are designed to assess (Weathers et al., 1993). Consequently, the RBTSSS may assess intrusion symptoms related to emotionally painful, but not life-threatening experiences, more clearly by asking about "emotional upset" when memories occur and experiencing of memories when one does not want to (Carter & Pieterse, 2020). These findings underscore the need to include an assessment of RBTS as part of standard intake procedures when working with individuals who are at higher risk for racial trauma (e.g., people of color and individuals from Indigenous groups) because diagnostic measures of PTSD may underestimate the presence of race-related trauma symptoms.

Notably, in the current study, no differences in racial trauma symptom endorsement or negative affect were detected between White, Black, and other participants of color. Previous findings have been mixed, with one study also detecting no racial differences (Carter, Kirkinis, & Johnson, 2020). However, given the nature of racism in the United States, and disproportionately higher rates of exposure to racial discrimination among people of color compared to Whites, we might expect racial differences in reported severity or type of racial trauma symptoms. In fact, one study did find that people of color endorse a wider variety of racial trauma symptoms compared to Whites (Carter & Kirkinis, 2021). Therefore, the lack of differences among White and participants of color in the current study might be attributable to covariates that have previously been found important in the assessment of racial trauma among Whites. For instance, Carter, Roberson, and Johnson (2020) found Whites with lower levels of education and socioeconomic status tended to report more elevated RBTSS compared to their more educated and economically advantaged counterparts. The majority of this study's overall sample identified as lower and working class, and therefore could have included a higher proportion of White participants who also identified as poor or working class. Carter, Kirkinis, and Johnson (2020) and Carter, Roberson, and Johnson (2020) also found that White participants' reports of RBTSS were linked with racial identity development (i.e., how race functions within the United States and in their own lives as part of the dominant racial group). Specifically, less mature racial identity development was related to higher endorsed of RBTSS. Although racial identity development was not the focus of this study, it could explain similar racial trauma endorsement between White and participants of color.

Limitations and Future Research

Limitations of the current study should be considered and discussed. First, the current study utilized the PCL-C-17, a diagnostic measure of PTSD based on DSM-IV-TR criteria. While the PCL-5 based on DSM-V criteria was not available when data collection began on this project, future studies should utilize measures consistent with current diagnostic criteria. Secondly, the racial/ethnic make-up of the sample consisted of mostly White and Black participants, thus limiting the generalizability of the findings to other racial/ethnic groups including Latinx, Asian, Native American, and bi- and multiracial people. Relatedly, the size of this study sample limited our ability to consider how the relationship between RBTS and PTSD and negative affect may differentiate by race/ethnicity or age. Given that previous studies show that White Americans report less frequent and severe RBTS compared to people of color and the importance of racial identity development in the study of racial trauma among Whites, specifically, future studies should seek to compare the relationship between RBTS, and PTSD and negative affect within specific racial groups.

Given that the results of the study show that some symptoms (e.g., intrusion) may not manifest similarly following race-based and nonrace-related experiences, researchers might consider using qualitative approaches to understanding possible nuanced expressions of trauma-related symptoms following race-based encounters. Additionally, future investigations may consider exploring the degree of overlap between ICD-11 criteria for complex PTSD (C-PTSD) with RBTS, considering C-PTSD accounts for repeated or chronic exposure to stressors (Maercker, 2021).

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