The relationship of COVID-19 traumatic stress, cumulative trauma, and race to posttraumatic stress disorder symptoms

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Abstract
The purpose of this study was to test if coronavirus disease 2019 (COVID-19) traumatic stress predicts posttraumatic stress disorder (PTSD) symptoms after cumulative trauma and whether there is a three-way interaction between COVID-19 traumatic stress, cumulative trauma, and race in the prediction of PTSD. Using a cross-sectional design, a diverse sample of 745 participants completed measures of cumulative trauma, COVID-19 traumatic stress, and PTSD. COVID-19 traumatic stress accounted for a significant amount of the variance in PTSD above and beyond cumulative trauma. A significant interaction effect was found, indicating that the effect of COVID-19 traumatic stress in predicting PTSD varied as a function of cumulative trauma and that the effects of that interaction were different for Asians and Whites. There were generally comparable associations between COVID-19 traumatic stress and PTSD at low and high levels of cumulative trauma across most racial groups. However, for Asians, higher levels of cumulative trauma did not worsen the PTSD outcome as a function of COVID Traumatic Stress but did at low levels of cumulative trauma.

KEYWORDS
COVID-19 traumatic stress, cumulative trauma, race

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1 INTRODUCTION

The onset of coronavirus disease 2019 (COVID-19) and its numerous sequelae have led to a growing body of research addressing the mental health outcomes for exposure to the pandemic. Responding to Holmes et al. (2020) call for research regarding the mental health effects of the COVID-19 pandemic, many studies have found evidence for elevated levels of anxiety, depression, posttraumatic stress disorder symptoms, and distress in residents of China (e.g., Qiu et al., 2020), Italy (Forte et al., 2020), Spain (Gonzalez-Sanguino et al., 2020), Germany (Bauerle et al., 2020), India (Varshney et al., 2020), Egypt (El-Zoghby et al., 2020), Turkey (Kira, Alpay, et al., 2021), Hong Kong (Choi et al., 2020), and the USA (Liu, Zhang, Wong, et al., 2020). These studies offer evidence for conceptualizing the experience of COVID-19 as a potentially traumatic experience (e.g., Kira et al., 2020b) with severe mental health outcomes.

Several authors (e.g., Sherman et al., 2020) have noted the importance of understanding factors that might lead to increased adverse psychological effects of COVID-19. Recent research has offered evidence for heterogeneous effects of potentially traumatic experiences on mental health (e.g., Mancini, 2019). Sensitization models of trauma exposure (e.g., Post, 1992) suggest that prior experiences of trauma may heighten sensitivity to negative outcomes following exposure to subsequent potentially traumatic experiences. Indeed, recent authors have raised the concern that the COVID-19 pandemic would “either create and/or exacerbate symptoms related to prior trauma” (Liu, Zhang, Wong, et al., 2020; p. 2). This concern is consistent with previous studies which have found an increase in mental distress after sequential exposure to potentially traumatic events. For instance, Kinzie et al. (2002) investigated the impact of exposure to a new potentially traumatic event on previously traumatized refugees with and without pre-existing posttraumatic stress disorder (PTSD). Two months after exposure to the additional trauma, they found an increase in posttraumatic stress symptoms (PTS) in all participants. Lahav (2020) appears to be the only researcher to have investigated the relationship of previous trauma and COVID-19 to psychological distress. In a sample of Israeli adults, Lahav found that individuals previously exposed to a traumatic event appear to be more vulnerable to distress when facing COVID-19 related stressors. In addition, those who had experienced continuous traumatic stress (e.g., exposure to constant rocket shellings) were more distressed than those who had experienced a traumatic event that had ended. While making an important contribution to the literature addressing the impact of COVID-19 on potentially vulnerable groups, the study did not measure the effects of cumulative trauma.

While most studies on the impact of cumulative trauma on mental health are conducted with high-risk populations, studies show that the experience of trauma is widespread, with a substantial proportion of the general population experiencing multiple traumatic events across the lifespan (Ogle et al., 2013). As a result, and given the universal nature of exposure to the COVID-19 pandemic, the measurement of cumulative trauma and its relationship to the potential trauma of COVID-19 in a general sample seems warranted.

In examining the mental health consequences of the COVID-19, several authors note that the most likely result will be long-term resilience (e.g., PeConga et al., 2020). Resilience is widely acknowledged as the normative response to exposure to trauma (Bonanno et al., 2011) and the modal response to even extreme and severe trauma (Galatzer-Levy et al., 2018). While studies have found that resilience is a significant protective factor for depression, PTSD, and general health after disasters (Kukihara et al., 2014), in a US sample of adults assessed during the COVID-19 pandemic, Liu, Zhang, Wong, et al. (2020) found that resilience was associated with lower levels of anxiety but not PTSD symptoms. The authors note that, given the unique characteristics of the COVID-19 pandemic, “psychological resilience that is typically associated with overcoming setbacks may not be sufficient for protecting against PTSD symptoms” (p. 5).

There is a growing consensus in the literature that the fear of contracting the COVID-19 virus, mitigation efforts adopted to counteract the spread of infection, and various additional consequences of the pandemic (e.g., economic hardship), may be perceived as traumatic events (e.g., Zhang et al., 2021). Kira et al. (2020b) described COVID-19 as a “mass collective and global traumatic stressor” (p. 1) and noted that it combines the fear of the present and future infection and death (e.g., Porcelli, 2020), actual and anticipated economic hardship and stress (e.g., McKibbin & Fernando, 2020) and the strains of lockdown including forced isolation, disturbed routines, and
disruptions in family and social life (e.g., Usher et al., 2020). In addition, authors have noted that COVID-19 is a worldwide stressor without a foreseeable endpoint and cannot be controlled by any single individual (Liu, Zhang, Wong, et al., 2020). Given these relatively unique characteristics, a strong argument can be made for measuring the impact of COVID-19 on individuals and communities as a specific trauma.

Several measures have recently been designed to measure COVID-19 stress and concerns (e.g., Conway et al., 2020; see NIH Office of Behavioral and Social Sciences Research). For instance, Tambling et al. (2021) developed a multidimensional measure of COVID-19 stressors, including infection-related stressors, daily routine-related stressors, and resource-related stressors. Kira et al., (2020b) drew from Lazarus and Folkman's (1984) conception of perceived psychological stress related to primary and secondary appraisal of a stressor. They developed an instrument designed to measure COVID-19 as traumatic stress. They defined COVID-stress as the extent to which someone reports feeling threatened, worried, nervous, or fearful about COVID-19 (Conway et al., 2020; Kira et al., 2020a). In addition, they included subscales measuring economic impact and isolation and routine disruption resulting from COVID-19. The COVID-19 Traumatic Stress Scale has been used in several international studies (e.g., Shuwiekh et al., 2020), which have offered evidence for the scale’s reliability and validity.

Data from the Centers for Disease Control and Prevention (CDC) indicate that different racial groups are disproportionately affected by the COVID-19 pandemic (Center for Disease Control and Prevention, 2020). For instance, Black Americans experience higher COVID-19 hospitalization and mortality rates (Center for Disease Control and Prevention, 2020). However, differences between racial/ethnic groups in mental health effects of the pandemic are mixed. For instance, in a 2020 study of 10,368 US adults, Fitzpatrick et al. (2020) found that Asian respondents reported being more fearful and worried about the pandemic than their non-Asian counterparts. Still, there was no significant difference in the perception of a threat of COVID-19 between Asians and non-Asians. Native American and other race study participants reported less COVID-related fear, worry, and threat than their non-Native American and non-other race respondents. Hispanic respondents in the study reported being more fearful, worried, and felt more threatened by COVID-19 than their Non-Hispanic counterparts. In addition, respondents in the other race categories report lower depressive and anxiety symptoms than whites, and black respondents reported less anxiety than whites.

Similarly, mixed results for the differences in COVID-related stress and emotional distress among racial/ethnic groups have been found in older adults. For instance, in a cross-sectional sample of 94,550 adults over the age of 55, researchers found that exposure to pandemic-invoked stressors was related to higher levels of emotional distress among older adults. However, depending on the outcome measured, the results showed that older persons of color were more negatively impacted by COVID-19 than their White counterparts, while in other cases, older persons of color were less negatively affected than older White persons (Bui et al., 2021).

### 1.1 The present study

Evidence suggests that individuals previously exposed to traumatic events may be more vulnerable to distress when facing additional stressors (e.g., Kinzie et al., 2002). Numerous authors have indicated it is appropriate to conceptualize COVID-19 as a trauma (e.g., Kira et al., 2020b). While Lahav (2020) found that exposure to a traumatic event was related to increased distress due to COVID-19, the study did not measure cumulative trauma. In addition, Lahav (2020) used a nine-item measure of COVID-19-related stressors designed for the study, and no evidence for its reliability or validity was reported. Utilizing a recently validated measure of COVID-10 traumatic stress, the present study was designed to measure the relationship of cumulative trauma and COVID-19 traumatic stress to PTSD symptoms.

There is evidence for differential mental health effects of exposure to traumatic events based on race/ethnicity. For instance, Black Americans experienced significantly more posttraumatic stress symptoms than White Americans after Hurricanes Andrew (Perilla et al., 2002) and Ike (Davidson et al., 2013). However, there is some
mixed evidence for the differential mental health effects of the COVID-19 pandemic by racial/ethnic groups. The current study was designed to examine the potential interaction of race/ethnicity, COVID-10 traumatic stress, and cumulative trauma in the prediction of PTSD symptoms.

Based on this review of the current research, the following research questions are proposed.

Research Question 1. Does COVID-19 traumatic stress add additional variance in predicting PTSD symptoms over and above previously experienced trauma (cumulative trauma)?

Research Question 2. Is there an interaction between cumulative trauma, COVID-10 traumatic stress, and race/ethnicity in predicting PTSD symptoms?

2 | METHODS

2.1 | Participants and procedure

After obtaining IRB approval, participants were recruited via Amazon MTurk. Amazon MTurk provided participants with a link to Qualtrics, an online survey platform. They were presented with informed consent material followed by the scales listed below, with items within measures presented in random order. Participants were also recruited via an online SONA system at a Southeastern University. Participants were granted course credit for their participation. The SONA system provided participants with a link to Qualtrics, where they were presented with the same informed consent material and scales. Data screening procedures detected subjects who failed initial validity check items or provided careless, inconsistent, or invariable responses to items on questionnaires.

A final sample of 745 participants was recruited for the study, including 527 Amazon Mechanical Turk (MTurk) workers (from June 1 to June 16, 2020) and 218 undergraduate students recruited from a large Southeastern minority-serving university (from June 12 to July 17, 2020). The sample included 51.5% of participants identifying as cisgender women, 47.9% identifying as cisgender men, and 0.6% identifying as transgender. The ages of participants ranged from 18 to 77 (M = 33.74, SD = 12.23), and 15.9% of respondents reported their ethnicity as Hispanic or Latinx. The sample was racially diverse with 56.7% identifying as Non-Hispanic White, 23.1% as Black or African American, 12.5% as Asian or Asian American, 2.4% as American Indian or Alaska Natives, and 4.7% indicated “other” (2.9%) or selected multiple race categories (1.8%). Most of the participants indicated they lived in a suburban area (55.9%), with smaller numbers in urban (32.7%) and rural areas (11.5%). Participation was limited to the United States, and all but one of the 50 states were represented in the sample.

2.2 | Measures

Participants completed a demographic questionnaire along with the COVID-19 traumatic stress scale (Kira et al., 2020b), the Cumulative stressors and traumas scale (CTS-S-36 items) (Kira et al., 2008), and the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-V) (Blevins et al., 2015). To increase response rate and decrease participant burden, a multiform planned missingness design was utilized (see Graham et al., 2006). Used with full information maximum likelihood procedures for missing data, the approach produces reasonably accurate parameter estimates (e.g., Rioux et al., 2020).

2.2.1 | COVID-19 traumatic stress

The 12-item COVID-19 Traumatic Stress Scale was used to measure COVID-19 as complex traumatic stress (Center for Economic and Social Research, 2020; Conway et al., 2020; Kira et al., 2020b), in which participants
indicated the negative impact the coronavirus had on them. The scale includes three subscales: Threat/Fear of the Present and Future Infection and Death, Traumatic Economic Stress, and Isolation and Disturbed Routines. Analysis for this study focused on the Threat/Fear of Future Infection and Death subscale and its five items due to evidence of higher internal consistency for that subscale than the others (Kira, Shuwiekh, et al., 2021). Sample items from this subscale include, "I am afraid of the coronavirus (COVID-19)" and "I am stressed around other people because I worry I’ll catch the coronavirus (COVID-19)." Participants indicated which statements are most accurate for them on a scale of 1 (i.e., not true at all) to 5 (i.e., true nearly all the time). To calculate scores, ratings of items are summed, with higher scores indicating higher amounts of coronavirus traumatic stress specific to COVID-19 threat. The scale has good predictive, convergent-divergent, and construct validity (Kira et al., 2020b). In a sample of Arabic adults, the scale had an alpha of 0.88 for the full measure, and 0.84 for the Threat/Fear of Future Infection and Death subscale (Kira et al., 2020b; Kira et al., 2021). Omega reliability estimates for all of the measures appear in Table 1.

2.2.2 | Cumulative stress and trauma

The 36 item Cumulative Stressors and Traumas Scale (CTS-S; 36 items) was used to measure seven types of stressors/traumas (Kira et al., 2008). The seven stressors/traumas include collective identity trauma (e.g., discrimination and oppression), personal identity trauma (e.g., early childhood traumas), status/identity achievement traumas (e.g., failed business or dropped out of school), survival trauma (e.g., combat or natural disasters), attachment trauma (e.g., abandoned by parents), secondary trauma (i.e., the indirect impact of trauma on others), and gender discrimination. The CTS-S evaluates cumulative stressors and traumas in terms of the occurrence, frequency, type, negative appraisals, positive appraisals, and age when the trauma happened. The scale also includes three items that measure chronic and significant life stressors. Participants were asked to indicate their experience of each item on the measure on a scale of 0 (never) to 4 (many times). The scale has shown adequate construct, convergent, divergent, and predictive validity, as well as adequate test-retest stability (Kira et al., 2008). The CST-S had internal consistency ratings ranging from 0.86 to 0.82 in samples of Iraqi refugees who previously experienced trauma, adults who attended an outpatient mental health clinic in Egypt, Syrians living in Syria or Turkey, and clinical and nonclinical highly traumatized populations from different cultures (Kanaan et al., 2020; Kira et al., 2008, 2013, 2019).

2.2.3 | Posttraumatic stress disorder

Posttraumatic Stress Disorder (PTSD) symptoms were measured with the 20-item Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5; Weathers et al., 2013). The PCL-5 is a self-report measure that asks participants to rate their experiences of being bothered over the past month by repeated, disturbing, unwanted memories of

| TABLE 1 Descriptive statistics and correlations based on raw variable scores and factor scores |
| Scale/subscale | Raw score M (SD) | Factor score M (SD) | 1 | 2 | 3 |
|----------------|-----------------|-------------------|---|---|---|
| 1 COVID Traumatic Stress | 15.80 (5.25) | 0 (4.83) | 0.92 |
| 2 Cumulative Trauma | 22.20 (21.66) | 0 (17.27) | 0.26 | 0.93 |
| 3 PTSD Checklist (PCL-5) | 22.38 (19.39) | 0 (16.64) | 0.40 | 0.51 | 0.97 |

Note: Diagonal values in bold represent McDonald’s omega (ω) based on raw scores. Correlations were based on factor scores. All were significant (p < 0.001, one-tailed tests). Abbreviations: COVID-19, coronavirus disease 2019; PTSD, posttraumatic stress disorder; SD, standard deviation.
stressful experiences on a scale of 0 (not at all) to 4 (extremely). Items refer to the past month pertaining to a specific event and reflect symptoms within each of the four PTSD symptom clusters: intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. Sample items by symptom cluster include “Repeated, disturbing, and unwanted memories of the stressful experience?,” “Avoiding memories, thoughts, or feelings related to the stressful experience?,” “Blaming yourself or someone else for the stressful experience or what happened after it?,” and ‘Being “superalert” or “watchful or on guard?,” respectively. PTSD is diagnosed if participants score “moderately” (2) or above on at least one re-experiencing symptom, one avoiding symptom, two negative alterations in cognitions and mood symptoms, and two hyperarousal symptoms. The scale has demonstrated test-retest reliability, convergent validity, and discriminant validity (Blevins et al., 2015). The PCL-5 had a strong Cronbach’s reliability of 0.97 in a college student sample (Eddinger & McDevitt-Murphy, 2017), 0.95 in a sample of Korean adults who were victims of accidents or crimes (Lee et al., 2020), 0.94 in two studies involving trauma-exposed college students (Blevins et al., 2015), and 0.94 among a sample of Black and White adults (Gaffey et al., 2019).

3 | RESULTS

3.1 | Descriptive analyses

Table 1 displays total sample descriptive statistics (Ms, SDs) for the scores along with correlations and omega (ω) reliability estimates. Results revealed highly reliable scores. Because a planned missingness design was used, and scores were highly reliable, factor scores adjusted for unreliability were created in Mplus (Brown, 2015). Correlations between factor scores were significant and in the expected positive direction. Effect sizes of the correlations were in the medium to large range.

3.2 | Regression analyses

To address the first research question, “Does COVID-19 traumatic stress and additional variance in the prediction of PTSD symptoms, over and above previously experienced trauma (cumulative trauma)?,” we used PTSD as the dependent variable in a hierarchical regression, entering cumulative trauma in the first step and COVID-19 traumatic stress in the second step. Overall results of the linear regression was significant ($R^2 = 0.64, F[2,723] = 248.66, p<0.001$) with COVID-related stress accounting for a significant amount of the variance in PTSD above and beyond cumulative trauma ($\Delta R^2 = 0.029, F[1,721] = 35.35, p<0.001$).

3.3 | Moderator analyses

We used Hayes’ (2017) PROCESS macro to address the second research question, “Is there an interaction between cumulative trauma, COVID-10 traumatic stress, and race/ethnicity in the prediction of PTSD symptoms?” For purposes of examining race/ethnicity moderator effects, we focused on the four largest self-identified subgroups that combined represented 92.5% of the sample: Non-Hispanic Whites (N = 339, 49.2%), Non-Hispanic Black/African Americans (N = 146, 21.2%), Non-Hispanic Asians (N = 90, 13.1%), and Hispanics (N = 114, 16.5%). We used indicator coding to transform the four-category race/ethnicity into three dummy variables. Because the Non-Hispanic White group was the largest subgroup, we coded that group as the reference. Following procedures described by Hayes (2017), the three-race/ethnicity dummy variables (D1–D3) were positioned as moderators of the effects of COVID Traumatic Stress (CTS) and Cumulative Trauma (CT) in predicting PTSD symptoms (PCL-5).
Based on the dummy coding, D1 quantified the difference in PCL-5 scores between Non-Hispanic Black/African Americans and Whites, D2 quantified the difference between Non-Hispanic Asians and Whites, and D3 quantified the difference between Hispanics and Whites. The full model predicting PCL-5 scores consisted of five conditional effects (CTS, CT, and D1–D3), seven two-way interactions (CTS × CT, CTS × D1, CTS × D2, CT × D3, CT × D2, and CT × D3), and three three-way interactions (CTS × CT × D1, CTS × CT × D2, and CTS × CT × D3). Table 2 displays the results based on the full model.

The full model explained 55% of the variation in PCL scores, $R^2 = 0.55$, $F(15, 673) = 54.31$, $p < 0.001$. As shown in Table 2, the only higher-order interaction effect that was statistically significant was between CTS × CT × D2. Recall that D2 quantified the difference between Non-Hispanic Asians and Non-Hispanic Whites. Thus, the significant interaction effect indicated that the effect of COVID Traumatic Stress in predicting PTSD symptoms varied as a function of Cumulative Trauma, and that the effects of that interaction were different for Asians and Whites. The other nonsignificant interactions suggested that any moderating effects of Cumulative Trauma on COVID Traumatic Stress were comparable for the other race/ethnicity groups.

Threeway interactions are difficult to interpret, and these analyses included additional complexity with dummy-coded variables. Therefore, for the different race/ethnicity groups, we used a combination of simple slopes generated by PROCESS and visual displays to facilitate interpretation. The simple slopes were based on solving the full regression equation after entering values for dummy-coded race/ethnicity variables and low (16th percentile) and high (84th percentile) values for COVID Traumatic Stress (CTS) and Cumulative Trauma (CT). We created separate plots for the predicted PTSD symptoms scores (PCL-5) for the CTS × race/ethnicity interactions when CT levels were relatively low (Figure 1a) and relatively high (Figure 1b).

| Predictor | $B$  | $SE$  | $p$  |
|-----------|------|-------|------|
| COVID Traumatic Stress (CTS) | 0.87 | 0.14 | 0.000 |
| Cumulative Trauma (CT) | 0.63 | 0.04 | 0.000 |
| D1 | −2.18 | 1.18 | 0.065 |
| D2 | 1.36 | 1.68 | 0.417 |
| D3 | 4.46 | 1.32 | 0.001 |
| CTS × D1 | −0.03 | 0.24 | 0.906 |
| CTS × D2 | 0.09 | 0.39 | 0.809 |
| CTS × D3 | 0.31 | 0.27 | 0.256 |
| CTS × CT | 0.00 | 0.01 | 0.999 |
| CT × D1 | −0.08 | 0.08 | 0.307 |
| CT × D2 | 0.16 | 0.15 | 0.279 |
| CT × D3 | −0.03 | 0.08 | 0.709 |
| CTS × CT × D1 | 0.00 | 0.02 | 0.912 |
| CTS × CT × D2 | −0.06 | 0.03 | 0.015 |
| CTS × CT × D3 | −0.02 | 0.01 | 0.200 |

Note: D1, D2, and D3 were dummy-coded race/ethnicity variables. Non-Hispanic Whites served as the reference group.

Abbreviations: COVID-19, coronavirus disease 2019; PTSD, posttraumatic stress disorder; SE, standard error.
In general, there was a positive and significant association between COVID Traumatic Stress (CTS) and PTSD Symptoms, with higher levels of PTSD symptoms (PCL-5) emerging when subjects also reported higher levels of Cumulative Trauma (CT). When CT was low, the simple slopes for the association between CTS and PCL-5 were $B = 0.87$ (SE = 0.17), $B = 0.86$ (SE = 0.28), and $B = 1.42$ (SE = 0.27), $p < 0.002$, for Whites, Black/African Americans, and Hispanics, respectively (see Figure 1a). When CT was high, the slopes for those three groups were, $B = 0.87$ (SE = 0.22), $B = 0.81$ (SE = 0.25), and $B = 0.96$ (SE = 0.25), $p < 0.001$, respectively (see Figure 1b). Thus, there were generally comparable strengths of associations between CTS and PCL-5 for those three groups at low and high levels of CT. In contrast, compared with the other race/ethnicity groups, there was a stronger and positive association between CTS and PCL-5 for Asians, $B = 1.81$ (SE = 0.37), $p < 0.0001$, when CT was low. However, when CT

![Figure 1](image_url)

**FIGURE 1** Three-way interaction of COVID traumatic stress, cumulative trauma, and race/ethnicity predicting PTSD symptoms. (a) Low cumulative trauma. (b) High cumulative trauma. COVID-19, coronavirus disease 2019; PTSD, posttraumatic stress disorder.
was high, there was not a significant association between CTS and PCL-5, $B = 0.21$ ($SE = 0.54$), $p = 0.696$. Said differently, higher levels of Cumulative Trauma did not appear to worsen the PTSD symptoms outcome for Asians as a function of COVID Traumatic Stress. Instead, such a worsening of PTSD symptoms as a function of COVID Traumatic Stress emerged for that group at low levels of Cumulative Trauma.

4 | DISCUSSION

The Coronavirus pandemic has been called a "new type of trauma" and a “unique traumatic stressor” (Kira et al., 2020b, p. 1). While the current study results do not speak to the nature or dynamics of COVID-19 as traumatic stress, the results suggest that COVID-19 traumatic stress is highly related to PTSD symptoms apart from the influence of previous trauma. In addition, the results of the study suggest that COVID-19 had an additive and distinct effect on PTSD symptoms beyond the effect of cumulative trauma. These results are consistent with previous research findings showing increased symptoms after a new subsequent trauma among participants previously diagnosed with PTSD (e.g., Kinize et al., 2002). While not the focus of the moderation analysis in this study, it is important to note that no significant interaction between cumulative trauma and COVID-19 traumatic stress in predicting PTSD symptoms was detected. With an important qualifier, this finding suggests that, if COVID-19 is a unique traumatic stressor, its association with PTSD is not strengthened by a history of prior traumatic experiences.

As Schock et al. (2016) note, increases in PTSD symptoms after subsequent traumas are not well defined. Given the ongoing nature of the experience of COVID-19, the results of this study do not offer evidence for whether the PTSD symptoms related to COVID-19 are a reactivation/re-actualization of symptoms or a retraumatization for those previously exposed to trauma. Retraumatization is generally described as a significant exacerbation of posttraumatic symptoms and is a significantly longer-lasting increase of the pre-existing symptoms compared with reactivation/re-actualization (Schock et al., 2015). Future studies with longitudinal designs might address this important distinction by investigating previous diagnoses of PTSD and the severity and duration of PTSD symptoms resulting from COVID-19 traumatic stress.

The results of the study indicated that the effect of COVID traumatic stress in predicting PTSD symptoms varied as a function of Cumulative Trauma and that the effects of that interaction were different for Asians and Whites. Specifically, in contrast to White participants, higher levels of cumulative trauma did not appear to worsen the PTSD symptoms outcome for Asians as a function of COVID traumatic stress. The other nonsignificant interactions suggested that any moderating effects of cumulative trauma on COVID traumatic stress were comparable for the other race/ethnicity groups. These findings are consistent with previous research suggesting that the relationship between race/ethnicity, COVID-19 stress and trauma, and mental distress is complicated and may go beyond the simplistic categorization to include other factors (e.g., Liu et al., 2020).

One important factor to consider in interpreting the results of this study is the consistent finding that Asian Americans are less likely to report psychological distress than other identified groups (e.g., Takeuchi et al., 2007). In a recent investigation of COVID-19-related mental health symptomatology, Liu et al. (2020) found that Asian Americans were less likely to report high levels of depression, anxiety, and PTSD than other groups. Leong et al. (2013) note that several factors including ethnic identity, social networking, and family cohesion may serve as protective factors for mental health and these may be engaged at higher levels of cumulative trauma, insulating participants against the effects of COVID-19 traumatic stress.

It may also be essential to interpret this finding in the context of the increase in reports of discrimination and violence against Asian Americans (Congressional Asian American Pacific American Caucus, 2020). These incidents of violent attack, discrimination against businesses, and sinophobic portrayals in media (CAPAC, Schild et al., 2020) may be experienced as a secondary trauma or a reactivation/retraumatization of racial trauma (Liu & Midir, 2020). As a result, those Asian Americans having experienced higher levels of previous trauma may be more affected by being scapegoated as the source of COVID-19 in the United States (Tavernise & Oppel, 2020) and related incidents
of increased racism (Choi & Kulkarni, 2020) as a reactivation/retraumatization of previous trauma. Thus, COVID-19 specific trauma (e.g., personal fear of infection) may have a diminished impact on PTSD symptoms. In addition, while other groups of color may experience discrimination based on their risk status for COVID-19 or stress related to their increased vulnerability, Tambling et al. (2021) note that Asian Americans have the potential for internalized stigma related to COVID-19, resulting in an increased reactivation/retraumatization of previous trauma compared to other groups.

Although there is considerable literature documenting how social inequities and policies related to COVID-19 may disproportionately affect people of color and other marginalized groups (e.g., Liu & Modir, 2020), no moderating effect for race/ethnicity were detected in this study beyond the three-way interaction for Asian American participants. While this mixed finding is consistent with previous literature finding differing relationships (e.g., Bui et al., 2021; Fitzparick et al., 2020), there may be moderating effects not detected in this study. For instance, in reviewing the literature in COVID-19 test positivity, hospitalization, and morbidity, Khazanchi et al. (2020) found that disparities by race were highly influenced by socioeconomic marginalization among these groups. One weakness of the current study is that socioeconomic status was not gathered from participants. In fact, given the nature of the study participants, gathered from Amazon Turk and a large southeastern University, it might be argued that the sample was biased toward those who might be higher in socioeconomic status. Although plausible for those attending college (National Center for Education Statistics, 2019), some findings indicate that Amazon Turk workers tended to be low in socioeconomic status (Walters et al., 2018). Future research could improve this study by including socioeconomic data to investigate the potential “fundamental inequities that lie upstream of disparate COVID-19 outcomes” (Khazanchi et al., 2020, p. 2).

4.1 | Limitations and future research

Despite the strengths of the current study, including a large, nationally representative, and diverse sample and the use of sound psychometric instruments, the study has several additional limitations. Although some variables had logical temporal implications (e.g., cumulative trauma based on prior experiences), the study was limited by its cross-sectional design. As a result, no inferences regarding causality can be drawn. As noted earlier, future research using longitudinal designs will address the complexities of the relationships between cumulative trauma, COVID-19 traumatic stress, and race. The sample was large and diverse, but one important limitation is that subgroups within larger racial/ethnic groups were not identified. For instance, findings regarding the Asian American participants might hold for subgroups with family origins in East Asia but not for those from West Asian countries, or vice versa. Future research might include more nuanced and sophisticated measures of group identity and intersectionality. Finally, measurement was limited to self-reported data from individual respondents. Although the scales produced strong psychometric support, future studies might expand measurement approaches to include additional informants and methods (e.g., cardiovascular and physiological) for assessing the physical and psychological effects of COVID-related stress.

4.2 | Implications and conclusion

To summarize, we found that COVID traumatic stress and cumulative trauma were moderately to strongly predictive of current PTSD risk. A significant three-way interaction revealed that, in general, the association between COVID traumatic stress and PTSD was stronger for subjects who had past experiences with cumulative trauma. Against this general backdrop, effects for the Asian American subgroup were conspicuously different from the other racial/ethnic groups in this study. For Asian participants, there was a strong association between COVID traumatic stress PTSD, but only for those who had not experienced prior cumulative traumas. Surprisingly, Asians
who reported previous cumulative trauma showed no strong association between COVID traumatic stress and PTSD. Such results suggest varying implications of COVID-related stress and emphasize the importance of examining subgroups in the community for potential exacerbating or buffering effects of COVID stress on mental health outcomes.

The results of this study have several implications for community psychology. For instance, given the evidence in this study for conceptualizing COVID-19 as a trauma, community psychologists may want to advocate for trauma-informed care in communities and schools. Given previous findings of increases in PTSD symptoms after subsequent traumas (e.g., Schock et al., 2016) and the differential impact of COVID-19 for marginalized groups (e.g., test positivity, hospitalization; Khazanchi et al., 2020), implementing and advocating for trauma-informed care can be seen as "a social justice imperative" (Ridgard et al., 2015, p. 14) such that trauma-informed care can minimize disparities in outcomes related to the experience of trauma.

Consistent with the findings in this study of the differential effects of cumulative trauma and COVID-19 traumatic stress for Asian Americans, community psychologists are ideally positioned to engage with community partners in promoting and engaging antiracism efforts that explicitly address anti-Asian sentiment generally, and specifically related to COVID-19. As Lee and Waters (2021) note, increased intergroup contact and information campaigns that explicitly address antiracism themes may decrease discrimination and prevent poorer mental health outcomes of Asians and Asian Americans.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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