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Original article

Latent typologies of posttraumatic stress disorder amongst first responders: a comparison to combat veterans

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ABSTRACT

First responders and veterans are disproportionately affected by posttraumatic stress disorder (PTSD). Findings from the extant literature suggest that there may be distinct subtypes of PTSD, and that differences in occupations and the types of traumas experienced may be related to different symptom presentations. As such, the present study used latent profile analysis to identify latent subtypes of PTSD in a carefully diagnosed sample of veterans and first responders. In doing so, we identified a four-profile solution: Cognitive Distress (26.9 %), Anhedonic Avoidance (33.2 %), Ruminative Arousal (20.3 %), and High Undifferentiated (19.6 %). We also examined the relationship between occupation type and the profiles. In doing so, we found that first responders were more likely to belong in the Cognitive Distress and Ruminative Arousal profiles compared to military personnel. Additionally, in comparison to law enforcement officers, firefighters were more likely to belong to the Cognitive Distress and Anhedonic Avoidant profiles. These findings may have important implications for how we treat PTSD in veterans and first responders.

1. Introduction

Posttraumatic stress disorder (PTSD) may occur following exposure to a traumatic event, with symptoms falling into four clusters: re-experiencing, avoidance, alterations in mood and cognitions, and alterations in arousal and reactivity (Diagnostic and Statistical Manual of Mental Disorders [DSM-5-TR]; American Psychiatric Association, 2022). Epidemiological studies put the lifetime prevalence of PTSD for civilians at 6.1 %, but combat veterans and first responders have higher prevalence (8.1 % and 13.6 %, respectively; Arena et al., 2025; Wisco et al., 2016). Although there is a robust literature examining the impact of and treatment for PTSD in combat veterans, much less is known about the clinical presentation of this disorder in first responders. Given its high prevalence, further understanding of how PTSD presents in first responders is needed.

The DSM-5-TR symptomatology of PTSD is complex; there are over 636,120 symptom combinations that could result in the diagnosis (Galatzer-Levy et al., 2013), thus individuals with the same disorder could present with completely different symptom profiles. Common statistical approaches used for understanding symptom presentation types of PTSD include latent profile analysis (LPA) and latent class analysis (LCA). LPA uses multiple continuous indicators to identify homogeneous latent subgroups within a heterogeneous population (Marsh et al., 2009). In other words, within a sample of individuals who meet criteria for PTSD, these approaches allow us to identify meaningful subgroups of PTSD marked by both differences in symptom severity as well as differences in the types of symptoms frequently endorsed within each distinct subgroup. This in turn has the potential to provide clinically meaningful information regarding a given individuals' PTSD presentation that extends beyond simply the "presence" and "severity" of a PTSD diagnosis.

To date, many studies utilizing LPA analyses have focused on veteran/military populations. This approach has identified latent subgroups conceptualized by (a) symptom severity (e.g., Moderate, Severe, and Highly Severe; Jongedijk et al., 2020) and (b) unique patterns of symptom presentation (e.g., Dysphoric [negative affect and anhedonia], Threat [intrusion, avoidance, and anxious arousal], and High [undifferentiated] symptom classes; Byrne et al., 2019). In a sample specifically of active-duty Special Operations Forces (SOF), LPA results yielded a four-profile solution with profiles based on a combination of qualitative and quantitative descriptors (i.e., Low *Re*-Experiencing/Avoidant, High *Re*-Experiencing/Avoidant, Low Symptom, and

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High Symptom; Trachik et al., 2024).

In many ways, the occupational environment of first responders is similar to that of the military. Both groups work within a rank system (Lieutenant, Captain, Chief), wear uniforms, and use terms such as the brotherhood, my brothers and sisters, and second family to describe their close personal connections with their colleagues. That said, while both groups demonstrate cultural similarities and experience traumatic events at heightened frequency, it is unclear if the types of traumas they face impact the subsequent presentation of their PTSD symptoms. In fact, the literature on PTSD symptom profiles in the first responder population is quite sparse. In a sample of World Trade Center responders (including but not limited to first responders; Horn et al., 2016), a three-profile solution was identified with PTSD types labeled Dysphoric, Threat, and High. Notably, two other investigations have examined latent typologies of PTSD in first responders (Griffith et al., 2022; Kim et al., 2024). However, these studies included selected items from measures assessing other issues such as anger, depression, and alcohol use in addition to PTSD symptoms, thus rendering comparisons to profile analyses using only PTSD symptoms impossible. In short, to date, there are no studies that have examined profiles of PTSD symptoms using a clinically diagnosed sample of first responders with PTSD.

Furthermore, the label "first responders" represents occupations with very different functions, even though they all may respond to traumatic events (e.g., responding to a burglary in progress vs. responding to an automobile accident with injuries). Therefore, it is reasonable to hypothesize that even within the first responder group, differences in exposure to traumatic events may occur based on one's specific profession. In turn, the specific event may lead to different PTSD symptoms. Previous LCA/LPA studies support this hypothesis. For example, individuals who reported combat-related traumas were more likely to be in the High symptom class than those who reported illness or injuries occurring to relatives or friends as their worst trauma (Campbell et al., 2020). In another study, individuals who reported military-related traumas as their worst event were more likely to be in the Threat class whereas those who reported sudden abandonment by a spouse, partner, parent, or family, were more likely to fall into a Dysphoric class (Byrne et al., 2019). Even within a military population, the particular specialty may dictate exposure to traumatic events and subsequent PTSD symptoms. For example, Trachik et al. (2024) reported that differences in PTSD profiles emerged when a sample of special operations forces (SOF) sample was stratified by Operators and Support Personnel. Specifically, both samples resulted in four profiles, with High and Low as two of the four types. However, whereas the operator sample included Threat and Dysphoric profiles, the remaining two profiles for support personnel were named High *Re*-experiencing/Avoidant and Low *Re*-experiencing/Avoidant.

Trachik and colleagues' (2024) study has direct implications for examining symptom profiles in first responders as it clearly documents that even within a specific group (Special Operations Forces), differences in PTSD presentations exist and may be influenced by the specific assignment (operator vs. support personnel). Thus, not only might first responder profiles differ from those found in military populations, but profile differences may also exist within the first responder population (e.g., firefighter [FF] versus law enforcement officer [LEO]). Preliminary data from treatment-seeking first responders at our clinic provide support for this hypothesis. Among 308 firefighters diagnosed with PTSD, 25 % identified a pediatric death as their Criterion A trauma, whereas only 5 % identified mass violence or shootings as their index event (D. Beidel, personal communication, May 1, 2025). In contrast, among 141 law enforcement officers with PTSD, 41 % identified mass shootings as their primary Criterion A trauma, while 10 % endorsed a pediatric death. Accordingly, given that the types of traumatic events likely vary across treatment-seeking first responder groups (e.g., firefighters versus law enforcement officers), it is reasonable to hypothesize that their resultant symptom profiles may also differ.

Debates regarding PTSD symptoms, clusters, and subtypes are not merely academic; they have direct implications for clinical intervention. Since the early 2000s, medical and psychological disciplines have increasingly emphasized precision medicine and personalized care—approaches that prioritize individual differences in the prevention and treatment of illness (U.S. Food and Drug Administration, 2018). Identifying occupation-specific manifestations of PTSD represents a critical initial step toward developing culturally informed and contextually relevant treatment plans. When clinicians can incorporate occupation-related risk factors into case conceptualization and subsequent treatment planning, the likelihood of achieving symptom reduction or remission may be enhanced. Support for this perspective comes from Drysdale et al. (2017), who demonstrated that distinct depression subtypes were associated with differential responses to treatment.

In summary, there are theoretical and methodological reasons why it is important to examine PTSD typologies in first responders, both in comparison to military populations and within different subgroups of the first responder populations. According to the Department of Commerce (U.S. Department of Commerce, 2022), there are an estimated 4.6 million people who serve as career or volunteer first responders within the United States. They respond to numerous traumatic events throughout their careers, yet the number and nature of their traumas may differ substantially from what is experienced in military service, with possible further differences based on specific first responder occupation (e.g., law enforcement vs fire service).

Ultimately, these differences highlight the need to consider the manifestation of PTSD symptom profiles within specific high-risk occupations. With consistent personnel shortages and increasing demands in mental health care, initiatives that seek to improve treatment efficiency as well as efficacy are sorely needed. This purpose of this investigation is to identify distinct PTSD profiles using Latent Profile Analysis based on PCL-5 scores in a sample of treatment-seeking first responders and military veterans, all of whom met criteria for PTSD based on a CAPS-5 diagnostic interview.

The study hypotheses are as follows:

(1) Consistent with the prior literature, a Latent Profile Analysis (LPA) conducted on the PCL-5 scores from a sample of treatment-seeking individuals diagnosed with PTSD will yield four profiles, with at least one profile characterized by greater endorsement of negative mood and cognition symptoms and at least one profile characterized by greater endorsement of intrusion and arousal symptoms.

(2) First responders and veterans will differ in their likelihood of belonging to different PTSD symptom profiles, with first responders more likely to belong to a profile characterized by dysphoria/anhedonia, and military personnel more likely to belong to a high symptom or threat profile.

(3) Within the first responder group and given the different prevalence of traumatic events within the first responder population, firefighters and law enforcement officers will differ in the likelihood of belonging to different PTSD symptom profiles, with firefighters more likely to belong to a profile characterized dysphoria/anhedonia, and law enforcement more likely to belong to a threat or high profile.

2. Method

2.1. Participants

There were 443 participants in the sample, 122 veterans and 321 first responders (law enforcement [$n = 109$] and firefighters [$n = 212$]). All participants were seeking treatment at UCF RESTORES, a clinical research center located at the University of Central Florida (UCF). All participants received a diagnosis of PTSD, based on the Clinician Administered PTSD Scale for DSM-5 (CAPS-5; Weathers et al., 2013). In the case where a first responder was also a veteran ($n = 80$), for the purpose of this study, the individual was coded as either veteran or first responder based on the trauma for which they sought treatment. This decision was based on the rationale that not every veteran experiences

Table 1
Demographic data.

	Group Veteran $n = 122$ M or n	SD or %	First Responder $n = 321$ M or n	SD or %
Age	42.03	12.89	41.41	9.75
Sex				
Male	93	76.23	247	76.95
Female	23	18.85	59	18.38
Not Reported	6	4.92	15	4.67
Race				
White	89	72.95	273	85.05
Black or African American	16	13.11	9	2.8
Asian	1	0.82	0	0
American Indian or Alaska Native	1	0.82	1	0.31
Native Hawaiian or Other Pacific Islander	0	0	2	0.62
Other	5	4.1	11	3.43
Multiracial	2	1.64	7	2.18
Not Reported	8	6.56	18	5.61
Ethnicity				
Hispanic	89	72.95	206	64.17
Non-Hispanic	23	18.85	96	29.91
Not Reported	6	4.92	15	4.67

Note: Sex in this instance reflects the binary categorization that was assigned at birth.

combat or other traumatic events during their military service and thus would not automatically be at risk for the presence of PTSD simply as a result of military service.[1]

All participants signed a consent form indicating that their deidentified assessment data could be used in aggregate format by the center for the purpose of research on trauma and PTSD. The analysis of the deidentified clinic data for research purposes was approved by the UCF Institutional Review Board. Demographic data for age, sex, race, and ethnicity are presented in Table 1.

2.2. Measures

2.2.1. Clinician-administered PTSD scale for DSM-5 (CAPS-5; Weathers et al., 2013)

The CAPS-5 is a structured clinician administered diagnostic interview that assesses symptoms of PTSD within the past month and is considered the gold-standard based on its high interrater ($\kappa = 0.78$ to 1.00) and good test-retest reliability ($\kappa = 0.83$). It also demonstrates high interrater reliability for total severity score (ICC = 0.91), good internal consistency for severity items ($\alpha = 0.88$), and good convergent and discriminant validity (Weathers et al., 2018). Diagnostic interviews were administered by master's level clinicians and graduate students in a Clinical Psychology PhD program. All clinicians were trained in the administration of the CAPS-5 using the National Center for PTSD's CAPS-5 training curriculum with onsite supervision provided by clinical faculty.

2.2.2. Posttraumatic stress disorder checklist for DSM-5 (PCL-5; Blevins et al., 2015)

The PCL-5 is a self-report measure of DSM-5 PTSD symptoms, rated for severity on a scale from 0 (not at all) to 4 (extremely). The PCL-5 is a reliable and valid measure of PTSD symptoms (Blevins et al., 2015) and has excellent internal consistency ($\alpha = 0.96$), and good test-retest reliability ($r = 0.84$). It also demonstrates good convergent and discriminant validity with a veteran sample (Bovin et al., 2016). Similarly, in a sample of first responders (Morrison et al., 2021), internal consistency (Cronbach's alpha) for the sample was 0.94. In addition, the scale demonstrated good convergent and discriminant validity. Signal detection analysis indicated good diagnostic accuracy for PTSD. In this study, internal consistency for the veteran and first responder groups was good ($\alpha = 0.92$ and $\alpha = 0.88$, respectively).

2.3. Procedure

After signing consent forms for treatment and participation in research studies at the clinic, participants completed a battery of self-report measures, which included the PCL-5. After, participants met with their clinician who administered the CAPS-5 to determine a diagnosis of PTSD.

2.4. Analytic strategy

LPA analyses were conducted using Mplus (Muthén & Muthén, 1998–2017). LPA is a person-centered approach within the group of mixture models, which uses continuous indicators to determine profile membership that maximizes the probability of precisely describing the individuals (Meyer et al., 2013; Meyer & Morin, 2016). The results of previous studies, interpretability of profiles, class size, as well as statistical criteria were relied on to determine the best fitting model and number of profiles (Min & Su, 2020). These statistical criteria include: the Lo-Mendell-Rubin Likelihood Ratio Test (LMRT; Lo, 2001), the Bootstrap Likelihood Ratio Test (BLRT; McLachlan & Peel, 2000), the Akaike information criterion (AIC; Akaike, 1987), the Bayesian information criterion (BIC; Schwarz, 1978), the sample-size adjusted BIC (sBIC; Sclove, 1987), and entropy (Asparouhov & Muthén, 2014). Models with lower AIC, BIC, and adjusted BIC indicate better fit. The BLRT and LMRT compare the fit of a target model against a model with one fewer profiles, and a significant result indicates that the target model with more profiles fits better than the model with fewer profiles. Entropy indicates the distinctiveness of each profile, with a higher value suggesting better profile separation. In addition to the statistical criteria, we relied heavily on the interpretability of profiles such that the profiles truly represented latent typologies of PTSD. In addition, to avoid choosing an overfitting model that extracted too many profiles, only models with each profile containing more than 10 % of the sample size are considered (Min & Su, 2020; Sinha et al., 2021).

One advantage associated with LPA is the ability to directly integrate covariates into the model in order to assess their relationships with profile membership (Morin et al., 2018). We used an advanced three-step approach of mixture modeling with auxiliary variables (Asparouhov & Muthén, 2014) to examine the relationships between latent profiles and predictors (e.g., first responders vs. military personnel or firefighter vs. law enforcement). The three-step approach is an efficient, automated procedure to implement in Mplus with the AUXILIARY function and R3STEP command.[2]

3. Results

Table 2 displays the results of the LPA models. As predicted by the first hypothesis, the LPA analysis of the PCL-5 supported a four-profile solution, as it yielded the lowest AIC, BIC, sBIC, CAIC, and a

[1] At the request of journal reviewers, the analysis reported in this paper was run separately with the 80 dual veterans and first responders removed from the sample. Removal of the participants did not change the outcome with the exception of one difference between firefighters and police officers, which no longer met criteria for statistical significance. Inasmuch as that difference was not a result of the dual status of veteran and first responder, we retained the full sample for the analysis in order to maximally power the analysis.

[2] We evaluated statistical power based on both prior methodological literature and Monte Carlo simulation-based power analyses and found strong evidence that the current study has adequate power to identify latent profiles using the LPA approach and to examine relationships between latent profiles and predictor groups.

Table 2
Fit statistics of latent profile analyses evaluating 2 to 6 profile solutions for PCL-5.

	AIC	BIC	sBIC	CAIC	Entropy	LMR	BLRT	df
PCL-5								
2-profile	26,166.84	26,498.42	26,241.36	26,579.42	0.90	2356.54**	2365.97**	81
3-profile	25,267.27	25,766.69	25,379.51	25,888.69	0.94	977.65	981.57**	122
4-profile	25,072.43	25,739.68	25,222.39	25,902.68	0.90	275.74	276.84**	163
5-profile	24,940.59	25,775.68	25,128.28	25,979.68	0.91	212.98	213.833**	204
6-profile	24,982.22	25,985.15	25,207.63	26,230.15	0.91	253.69	254.202**	245

Note. $N = 443$. * $p < .05$; ** $p < .01$.

significant BLRT statistic. Each profile had an adequate number of participants. Most importantly, the four profiles for the PCL-5 were theoretically supported based on previous empirical studies with military personnel and first responders (Byrne, et al., 2019; Campbell et al., 2020; Trachik et al., 2024).

Based on the four-factor solution, the individual profiles for the PCL-5 are illustrated in Fig. 1. Overall, 60 % of the sample fell into Profiles 1 and 2. Specifically Profile 1 accounted for 26.9 % of the sample ($n = 119$, military [Mil] $n = 20$, first responder [FR] $n = 99$) and was characterized by low overall PTSD symptomatology but with elevations on items primarily reflective of cognitive symptoms of PTSD (e.g., unwanted memories, avoidance of thoughts, trouble concentrating, and sleep issues). Due to these elevations, Profile 1 was named the Cognitive Distress profile.

Profile 2 contained 33.2 % of the sample ($n = 147$, Mil $n = 47$, FR $n = 100$) and was characterized by elevated avoidance, self-blame, and anhedonic symptoms. Profile 2 was named the Anhedonic Avoidant profile.

Profile 3 consisted of 20.3 % of the total sample ($n = 90$, Mil $n = 19$, FR $n = 71$) was characterized by elevations in cognitive symptoms of PTSD in addition to elevated physiological symptoms (e.g., physiological responses to trauma reminders and strong startle reactions) and was named the Ruminative Arousal profile.

Profile 4 (19.6 %, $n = 87$, Mil $n = 36$, FR $n = 51$) was characterized by overall higher endorsement of PTSD symptoms and was named the High Undifferentiated profile.

To address the second hypothesis, we examined whether first responders and military personnel were associated with different profiles. The dummy variable with first responders ($n = 321$) as the focal group and military personnel ($n = 122$) as the reference group was used to predict the profile membership based on the three-step mixture modeling approach. The results (see Table 3) indicated that first responders were significantly more likely than military personnel to fall into the Cognitive Distress profile (26.9 %; Mil = 16.81 %, FR = 83.19 %) than the Anhedonic Avoidant (32.2 %; Mil = 31.97 %, FR = 68.03 %) or High Undifferentiated (19.6 %; Mil = 41.38 %, FR = 58.62 %) profiles. Additionally, first responders were significantly more likely than military personnel to fall into the Ruminative Arousal (20.3 %; Mil = 21.11 %, FR = 78.89 %) profile than the High Undifferentiated (19.6 %; Mil = 41.38 %, FR = 58.62 %) profile.

With respect to the third hypothesis, the direct comparison between firefighters/EMS personnel ($n = 211$) to law enforcement officers ($n = 109$) indicated that when compared to law enforcement (LEO), firefighters/EMS were significantly more likely to fall into the Cognitive Distress (26.9 %; Fire/EMS = 72.45 %, LEO = 27.55 %) and Anhedonic Avoidant (32.2 %; Fire/EMS = 73 %, LEO = 27 %) profiles rather than the High Undifferentiated (19.6 %; Fire/EMS = 50.98 %, LEO = 49.02 %) profile. Additionally, firefighters/EMS were more likely that law

Table 3
Results of multinomial logistic regressions of participant group (i.e., first responders vs. military [reference] predicting profiles using three-step mixture modeling approach.

PCL-5 Profile Groups	*b*	*OR*
Cognitive Distress vs Anhedonic Avoidance	**0.897****	2.452
Cognitive Distress vs Ruminative Arousal	0.243	1.275
Cognitive Distress vs High Undifferentiated	**1.274****	3.575
Anhedonic Avoidance vs Ruminative Arousal	−0.654	0.520
Anhedonic Avoidance vs High Undifferentiated	0.377	1.458
Ruminative Arousal vs High Undifferentiated	**1.031****	2.804

Note. * $p < .05$; ** $p < .01$. *b* = coefficient, OR = odds ratio. Comparing odds of belonging to focal profile (listed first) vs referent profile (listed second).

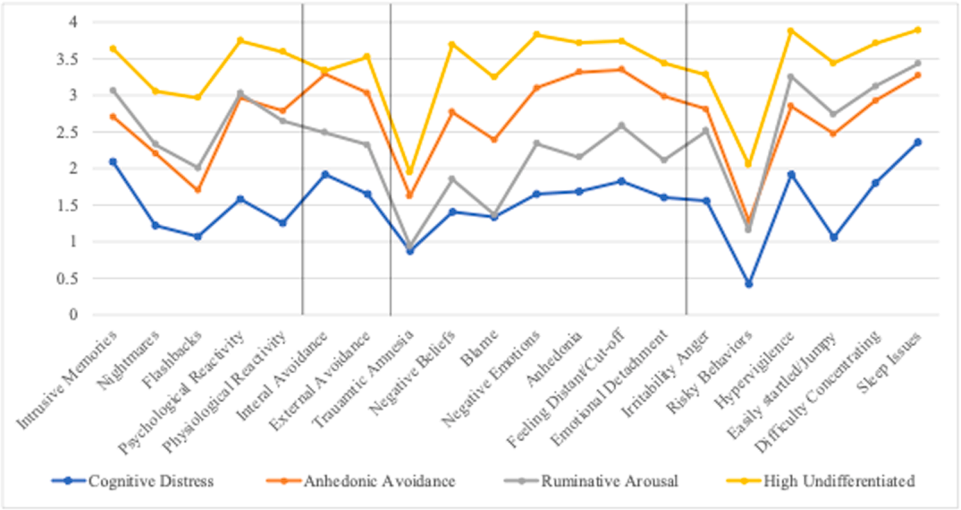

Fig. 1. Four profile solution.
Note: Profiles based on the 4-profile solution for PCL-5 (Sample size $N = 443$). Cognitive Distress $n = 119$. Anhedonic Avoidance $n = 147$. Ruminative Arousal $n = 90$. High Undifferentiated $n = 87$.

Table 4
Results of multinomial logistic regressions of first responder types (law enforcement officers as reference) predicting profiles using three-step mixture modeling approach.

	b	*OR*
Cognitive Distress vs Anhedonic Avoidance	−0.137	0.872
Cognitive Distress vs Ruminative Arousal	0.676	1.967
Cognitive Distress vs High Undifferentiated	**0.921***	2.512
Anhedonic Avoidance vs Ruminative Arousal	**0.813***	2.254
Anhedonic Avoidance vs High Undifferentiated	**1.058****	2.881
Ruminative Arousal vs High Undifferentiated	0.245	1.278

Note. * $p < .05$; ** $p < .01$. *b* = coefficient, OR = odds ratio. Comparing odds of belonging to focal profile (listed first) vs referent profile (listed second).

enforcement to fall into the Anhedonic Avoidant (32.2 %; Fire/EMS = 73 %, LEO = 27 %) rather than the Ruminative Arousal (20.3 %; Fire/EMS = 57.75 %, LEO = 49.02 %) profile (See Table 4).

4. Discussion

Prior to discussing the study's outcome, it is important to note that the methodology used to determine a PTSD diagnosis in this sample differed from prior investigations. Specifically, this investigation used the CAPS-5 (considered the gold-standard for diagnosing PTSD) to determine the presence of a PTSD diagnosis, whereas prior studies used cut-off score that suggest the possible presence of a PTSD diagnosis. Although common practice, the use of a cut-off score is problematic. Specifically, the PCL-5 for example, was "designed primarily to capture information from respondents about the extent to which they may be experiencing *distress* related to PTSD symptoms" (Bovin & Marx, 2023), not necessarily the *presence* of the symptoms. Numerous discrepancies between PCL-5 item responses and concordant CAPS-5 interview ratings can occur at the item, cluster, and total score levels. Completing the PCL-5 without clinical guidance could result in respondent errors, such as not understanding the difference between nightmares and flashbacks, or endorsing distress rather than accurate symptom presence or severity (see Kramer et al., 2023 for a full discussion). Therefore, the results of this investigation represent an important additional step toward understanding the issue of PTSD symptom profiles, as the clinical diagnosis was based on a tool specifically developed for the purpose of the diagnosis.

Returning to the results of the investigation, the LPA resulted in a 4-profile solution, with several findings consistent with previous investigations (Campbell et al., 2020; Trachik et al., 2024). These four profiles (Cognitive Distress, Anhedonic Avoidant, Ruminative Arousal, and High Undifferentiated) illustrate the variety of symptoms that can result in a PTSD diagnosis. We deliberated naming our Cognitive Distress profile as "Low" but decided against it as that label does not provide much guidance for clinicians constructing a treatment plan. Additionally, "low" PTSD symptomatology seems inconsistent with the endorsement of symptoms causing enough distress and impairment to warrant a PTSD diagnosis. Instead, we chose a name that described the highest elevations within that profile.

As opposed to veterans, first responders comprised 83 % of the individuals in the Cognitive Distress profile and 79 % of the people in the Ruminative Arousal profile. The significant differences in distribution of patients falling into these different profiles is partly consistent with our second hypothesis that first responders would be more likely to have a profile consistent with dysphoric symptoms of PTSD (unwanted memories, avoidance of thoughts, trouble concentrating, sleep issues, and sometimes accompanied by physiological responses to trauma reminders and strong startle reactions). In contrast, there was less disparity between the percentage of veterans and first responders who fell into the Ruminative Arousal and High Undifferentiated profiles.

Our extensive clinical experience with first responders drove us to consider whether there would be differences between firefighter/EMS and law enforcement officers. The results provide support for our third hypothesis that firefighters/EMS were more likely to have profiles characterized by Cognitive Distress or Anhedonic Avoidance rather than their law enforcement counterparts, who were more likely to belong to profiles characterized by rumination plus arousal (Ruminative Arousal) or undifferentiated elevated symptomatology (High Undifferentiated), both of which are more consistent with a threat profile. These results are consistent with Trachik et al. (2024) where subgroups within the SOF community (Operators vs. Support personnel) demonstrated different profiles when separate LPA analyses were conducted. As noted by those authors, there could be a myriad of reasons that produced these different symptom profiles, including different selection, training, and operational experiences.

These three factors, specifically operational experience, are particularly relevant for understanding subgroups of first responders. As noted in the introduction, informal analysis of first responders seeking treatment at our clinic indicates differences in the most common traumatic events endorsed by each occupation (i.e., pediatric death for firefighters and shootings/mass casualty for law enforcement). While both meet Criterion A, these different events are likely to result in different emotional triggers and reactions. Clinicians planning treatment should be mindful of these differences in an effort to provide culturally responsive and efficient care consistent with personalized medicine approaches. For example, individuals whose symptom profile is most consistent with a Cognitive Distress profile may be best served by Cognitive Processing Therapy (CPT; Resick et al., 2024), whereas exposure therapy and Behavioral Activation Therapy for Depression (BAT-D; Lejuez et al., 2001) may be a better treatment option for individuals whose symptoms are more consistent with the Anhedonic Avoidant profile. Future studies should consider examining whether subtypes of PTSD may predict differential response to treatment.

To our knowledge this is the first investigation to compare PTSD symptom profiles in a carefully diagnosed treatment-seeking sample of veterans, first responders, and within types of the first responders (e.g., firefighter versus law enforcement officer). Although this study is limited by a smaller sample size of law enforcement officers (compared to those from the fire service), the sample size is sufficient for the purposes of an initial investigation. Another limitation important to note is that all participants included in the present study were seeking treatment. Thus, findings may not be generalizable to all individuals with PTSD. A last limitation of note, a subset of the sample identified as both "veteran" and "first responder" ($n = 80$). To address this, we reviewed the index traumas of each "Both" participant to determine whether they were endorsing symptoms of PTSD related to a criterion A event resulting from their experience in the military or during their time as a first responder. As such, individuals identified as "Both" were assigned to one occupation or the other based on the event they reported as the most distressing to them. Future investigations may consider addressing this limitation by examining how PTSD subtypes relate to common trauma types experienced by veterans and first responders (e.g., combat, pediatric drowning, mass shooting) as opposed to occupation type as has been done in several previous studies (Byrne et al., 2019 and Campbell et al. 2020). That said, even within trauma type exists similar limitations to classifying participants as exists with occupation type. For example, a firefighter may endorse a "natural disaster" as their worst index trauma. However, even within this single trauma type exists great heterogeneity in the ways in which a "natural disaster" may be experienced. For instance, this could mean that they personally experienced a natural disaster and personally experienced threat to their own life, or it could

mean that they responded to the aftermath of disaster and were exposed to aversive and gory details. These differences, though subtle may have important implications for subsequent PTSD presentations. Such a study examining these nuances in traumatic events and their relationship to subsequent symptom profiles is currently underway in our clinic.

Despite these limitations, the results of this investigation demonstrate the variability in PTSD symptom presentations with regards to differences in symptom severity and type of symptom endorsement between two populations at high risk for the onset of PTSD. Given the continued less than optimal treatment response rates for PTSD, there is a need for evidence-based practices that inform the tailoring of treatments to meet the unique presenting concerns of patients. The results from the present study represent an initial step towards addressing this issue and providing personalized care for first responders diagnosed with PTSD.

Author statement

We confirm that the manuscript is original, has not been previously published, and is not currently under consideration for publication elsewhere. All authors have meaningfully contributed to the manuscript and agree with its submission in its current format to *Psychiatry Research*.

CRediT authorship contribution statement

Kathryn D. O'Dell: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Ashley T. Winch:** Writing – review & editing, Methodology, Data curation, Conceptualization. **Shiyang Su:** Writing – review & editing, Writing – original draft, Formal analysis. **Clint A. Bowers:** Writing – review & editing, Conceptualization. **Amie R. Newins:** Writing – review & editing. **Deborah C. Beidel:** Writing – review & editing, Writing – original draft, Conceptualization.

Declaration of competing interest

We recognize the importance of transparency, and the need for disclosure of potential conflicts of interest to maintain the integrity of published research. As such, this declaration has been drafted with the intent of disclosing all relevant interests that may relate to the corresponding manuscript under review. Kathryn D. O'Dell, PhD Student, Department of Psychology, UCF RESTORES, University of Central Florida. I have nothing to declare, nor do any of the other authors listed as contributors on this manuscript.

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