The Many Presentations of Posttraumatic Stress Disorder: An Empirical Examination of Theoretical Possibilities

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Abstract

Posttraumatic stress disorder (PTSD) has been a controversial diagnosis, with concerns including the sheer number of possible minimal diagnostic combinations (1,750), increasing to >10,000 theoretical possibilities in Diagnostic and Statistical Manual of Mental Disorders (5th ed.) proposals. This study examined whether the theoretical combinations postulated actually occur in a large sample of military personnel. The design of the study was a retrospective examination of PTSD checklists from 3,810 participants who, based on scores, endorsed symptoms consistent with probable PTSD. Combinations of PTSD Checklist–Civilian Version (PCL-C) symptom clusters were identified using data from active-duty military personnel who completed the 2005 and the 2008 Department of Defense (DoD) Health Related Behaviors Among Active Duty Military Personnel Survey. The study examined (a) occurrence of combinations, (b) unique minimum combinations, (c) most frequent combinations, and (d) replication of symptom combinations and clusters. The PCL-C scores showed 1,837 unique scoring combinations, 83.5% (1,533/1,837) of the observed unique scoring combinations occurred just once. The most frequently occurring combination (17/17 endorsed) accounted for 955 participants (25.1%), the second most frequent (16/17 endorsed) accounted for 75 participants (2.0%). PTSD most often presented as a unique constellation of symptom clusters, either capturing symptoms while allowing for considerable variability in its presentation, reflecting different severities of the disorder, or raising concerns about the classification itself, and any future classification that Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-V) might develop.

Keywords
military, posttraumatic stress disorder, healthcare survey

This problem of number and allowable combination of symptoms holds considerable concern for diagnostic utility, with such heterogeneity of symptoms making understanding about what we mean when someone is said to have PTSD nearly impossible. Which symptoms are being described? What and how does each variant of the disorder respond to a treatment? Which cluster of symptoms are we even agreeing to be inherent and acceptable variations? It is possible that these broad diagnostic allowances, needed to capture the heterogeneity of symptoms that can follow a traumatic event, affect our research and treatment outcomes. The unreliability of reaching a diagnosis has not gone unnoticed, with growing concerns over what are normal reactions to trauma,

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possible overlap with other disorders, potential compensatory gain, and the lack of correlation with confirmable trauma being only some of the problems identified (Barglow, Bowman, & Friedlander, 2006; Frueh et al., 2005; Wilson & Barglow, 2009). If PTSD has a true occurrence in the clinical world holding the entire symptom combinations theoretically argued, this reality would hold considerable sway to reconsider the ramifications of the classification schema in place and in any future proposals. The theoretical versus actual presentation of symptoms is a testable occurrence. If there truly are more than 1,750 varieties of the same disorder, this might explain why some “varieties” of PTSD respond to some treatments and not others, and could offer an empirical option for criterion selection that holds practical, theoretical, and heuristic value.

This study examined two large data sets of active-duty military personnel to determine the (a) occurrence of unique PTSD symptom combinations and (b) replication of symptom combinations and clusters.

Method

Participants

This research utilized a retrospective analysis of data from active-duty military health care personnel who anonymously completed the 2005 and 2008 Department of Defense (DoD) Survey of Health Related Behaviors Among Active Duty Military Personnel (henceforth HRB survey; DoD, 2005, 2008). The HRB survey, conducted every 2 to 4 years, resulted in a total of 3,810 eligible participants for analysis. The combined 2005-2008 sample consisted of 40,836 useable questionnaires (9,566 Army; 11,264 Navy; 8,473 Marine Corps; and 11,533 Air Force) and reflected an average response rate of 51%. Each of the 17 items were dichotomized as yes (scores ≥3) or no (<3). Items were then concatenated in test order to create each unique combination of scores with domains separated by hyphens. The overall response rate was 51.8% for 2005 and 71.6% for 2008. For this work, probable PTSD was defined as one endorsed item score ≥3 from Items 1 to 5, three endorsed items from Items 6, 7, 8, and 9 but not Items 10, 11, or 12, in Criterion C, and Items 13, 14, and 15, but not Items 16 or 12 would have a specific combination “11111-1111000-11100.”

Selected Participants

The use of the PCL-C score and meeting DSM-IV criterion resulted in a total of 3,810 eligible participants for analysis. The combined 2005-2008 sample consisted of 40,836 useable questionnaires (9,566 Army; 11,264 Navy; 8,473 Marine Corps; and 11,533 Air Force) and reflected an overall response of 51%. Each of the 17 items were dichotomized as yes (scores ≥3) or no (<3). Items were then concatenated in test order to create each unique combination of scores with domains separated by hyphens. The overall response rate was 51.8% for 2005 and 71.6% for 2008. For this work, probable PTSD was defined as a total PCL-C score ≥44 and DSM-IV criterion: one endorsed item score ≥3 from Items 1 to 5, three endorsed items from Items 7 to 12, and two endorsed items from Items 13 to 17.

Results

Participant Characteristics

Survey participants were on average 26.7 ± 7.0 years of age (2005: 26.7 ± 7.2; 2008: 26.7 ± 7.0), 65.1% White (2005: 58.0%; 2008: 68.0%) and 44.5% married (2005: 43.6%; 2008: 44.9%). Thirty-two percent of participants represented the Army (2005: 33.6%; 2008: 32.1%) and 25.0% the Navy (2005: 26.5%; 2008: 24.4%). Average PCL-C scores were 60.0 ± 11.6 (2005: 57.7 ± 10.7; 2008: 60.9 ± 11.8).
For the combined 2005 and 2008 surveys, only 5 of 3,810 (0.13%) total participants presented for the minimum score consistent with possible PTSD with 1 endorsed item for reexperiencing, 3 items for avoidance/numbing, and 2 items for increased arousal. Considered as separate domains, only 234 of 3,810 (6.1%) participants presented with the minimum score of 1 endorsed item for reexperiencing, 390 (10.2%) for 3 items for avoidance/numbing, and 355 (9.3%) for 2 items for increased arousal. For all participants, average item score for Criterion B, reexperiencing, was $M \pm SD = 3.9 \pm 1.3$; the most frequently endorsed items were Item 4, upset at reminders of the stressful experience (87.2%), and Item 1, repeated disturbing memories, thoughts, or images (84.9%). For Criterion C, avoidance/numbing, $M \pm SD = 5.6 \pm 1.4$; the most frequently endorsed items were Item 6, avoiding talking or thinking about stressful experience (87.8%), and Item 9, loss of interest in activities that used to be enjoyed (85.6%); and for Criterion D, increased arousal, $M \pm SD = 4.2 \pm 1.0$; the most frequently endorsed items were Item 13, trouble falling or staying asleep (88.8%), and Item 15, difficulty concentrating (88.3%; Table 1).

### Occurrence of Unique PTSD Symptom Combinations

There are $10^{14}$ unique scoring combinations for the PCL-C but only 1,750 unique combinations for obtaining the minimum criteria that are required to obtain a diagnosis of PTSD using the DSM-IV item scoring criteria. From these 3,810 participants identified in the combined 2005 and 2008 data sets as having probable PTSD, we identified 1,837 unique combinations—83.5% occurred just once (1,533/1,837). Stratified by year for 2005, from 1,118 participants identified as having probable PTSD, 714 unique combinations were identified. For 2008, from these 2,692 participants identified as having probable PTSD, 1,303 unique combinations were identified.

### Replication of Symptom Combinations and Clusters

The top 10 most frequently occurring unique combinations were comprised by 1,332 participants (35.0%; Table 2). The first (17/17 endorsed, 955 participants) and second (16/17 endorsed, 75 participants) most frequently occurring unique combinations accounted for 25.1% and 2.0%, respectively. In all, 83.5% (1,533/1,837) of the unique combinations occurred once; 9.1% (167/1,837) occurred twice; and 92.5% (1,700/1,837) occurred only once or twice. The top 2 PCL-C unique combinations were shared by both 2005 and 2008 samples. However, compared with the 2005 sample, the top 2 unique combinations for the 2008 sample year accounted for a greater percentage of the respective sample years (28.9% vs. 22.8%).

### Table 1. Frequency Scoring Positive ($\geq$3) per Item Using PCL/DSM-IV Items ($N = 3,810$).

| PCL-C item | All participants ($N = 3,810$) | 2005 ($n = 1,118$) | 2008 ($n = 2,692$) |
|------------|--------------------------------|-------------------|-------------------|
| **Criterion B: Reexperiencing** | | | |
| 1. Repetitive thoughts | 3,235 (84.9) | 934 (83.5) | 2,301 (85.5) |
| 2. Dreams | 2,891 (75.9) | 816 (73.0) | 2,075 (77.1) |
| 3. Flashbacks | 2,716 (71.3) | 771 (69.0) | 1,945 (72.3) |
| 4. Upset at reminders | 3,321 (87.2) | 950 (84.6) | 2,371 (88.1) |
| 5. Physiologic reactions | 2,952 (77.5) | 813 (72.7) | 2,139 (79.5) |
| **Criterion C: Avoidance/numbing** | | | |
| 6. Avoid thoughts | 3,347 (87.8) | 966 (86.4) | 2,381 (88.5) |
| 7. Avoid activities | 3,093 (81.2) | 867 (77.6) | 2,226 (82.7) |
| 8. Difficult recall | 2,519 (66.2) | 673 (60.2) | 1,846 (68.5) |
| 9. Loss of interest | 3,261 (85.6) | 850 (76.0) | 2,167 (80.5) |
| 10. Feels distant | 3,147 (82.6) | 957 (85.6) | 2,304 (85.6) |
| 11. Numbing | 3,147 (82.6) | 891 (79.7) | 2,256 (83.8) |
| 12. Short future | 2,836 (74.4) | 810 (72.5) | 2,026 (75.3) |
| **Criterion D: Increased arousal** | | | |
| 13. Sleep disturbance | 3,384 (88.8) | 984 (88.0) | 2,400 (89.2) |
| 14. Irritable and angry | 3,324 (87.2) | 964 (86.2) | 2,360 (87.7) |
| 15. Decreased concentration | 3,364 (88.3) | 960 (85.9) | 2,404 (89.0) |
| 16. Hypervigilance | 2,993 (78.6) | 877 (78.4) | 2,116 (78.6) |
| 17. Startle | 2,841 (74.6) | 810 (72.5) | 2,031 (75.5) |

Note: DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th ed.); PTSD = posttraumatic stress disorder; PCL-C = PTSD Checklist–Civilian Version.
For 2005, the top 10 most frequently occurring unique combinations were accounted for by 397 participants (35.5%; Table 2). The first (17/17 endorsed, n = 232) and second (16/17 endorsed, 22 participants) most frequently occurring unique combination accounted for 20.8% and 2.0%, respectively. Ninety percent (647/714) of the unique combinations occurred once; 5.2% (37/714) occurred twice; and 95.8% (684/714) occurred only once or twice.

For 2008, the top 10 most frequently occurring unique combinations were accounted for by 999 participants (37.1%; Table 2). The first (17/17 endorsed, 723 participants) and second (16/17 endorsed, 53 participants) most frequently occurring unique combinations accounted for 26.9% and 2.0%, respectively. Eighty-four percent (1,097/1,303) of the unique combinations occurred once; 16% (213/1,303) occurred twice; and 93.1% (1,190/1,303) occurred only once or twice.

For the top five most frequently occurring unique PCL-C combinations (Table 1), we compared participant characteristics. Age among participants who endorsed all 17 items (26.2 ± 6.9) was not significantly different from the overall study sample or the next four most frequently occurring unique PCL-C combinations. Furthermore, these participants endorsing all 17 items were similar to the overall study sample for race (White, 73.3%), married (45.9%), and equally distributed across service branch (Army, 35.9%; Navy, 26.6%; Marine Corps, 24.7; Air Force, 12.8%). No difference was observed among these top five groups for any of these characteristics or was any difference observed from 2005 to 2008.

Table 2. Top 10 Most Frequently Occurring Combinations of Items Using DSM-IV Item Scoring Criteria Among U.S. Military Personnel Identified With Probable PTSD (N = 3,810), 2005-2008.

| Unique PCL-C combination | Overall rank | Overall N (%) | 2005 rank | 2005 n (%) | 2008 rank | 2008 n (%) |
|---------------------------|-------------|---------------|-----------|------------|------------|------------|
| ++000- - ++++++++ - +++++ | 10          | 16 (0.4)      | 10        | 16 (0.4)   | 10         | 16 (0.4)   |
| +++00- ++++++++ - ++++++ | 10          | 16 (0.4)      | 7         | 13 (1.2)   | 3          | 4 (0.4)    |
| ++++++ - ++++++++ - +++++ | 5           | 34 (0.9)      | 5         | 11 (1.0)   | 5          | 11 (1.0)   |
| ++++++ - ++++++++ - +++++ | 3           | 42 (1.1)      | 3         | 13 (1.2)   | 4          | 29 (1.1)   |
| ++++++ - ++++++++ - +++++ | 2           | 75 (1.9)      | 2         | 2 (2.0)    | 2          | 53 (2.0)   |
| ++++++ - ++++++++ - +++++ | 1           | 955 (25.1)    | 1         | 1 (2.0)    | 1          | 723 (26.9) |

Note: DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th ed.); PTSD = posttraumatic stress disorder; PCL-C = PTSD Checklist–Civilian Version. A “+” represents an affirmative to a specific item (e.g., ≥3). The items left to right correspond to Items 1 to 17, grouped (“ - ”) by Criteria B, C, and D.

Discussion

This study confirmed that there were in fact a great number of possible combinations of PTSD drawing from PCL-C scores. However, while theoretically concerning, the number of combinations that meet minimal criterion are in actuality quite small. In contrast, the number of unique presentations is large, with about 80% of the respondents having a unique combination of symptoms, and approximately 90% exhibiting the combination with someone once, or in isolation. The overall clusters seem to capture symptoms while allowing for considerable variability in what exactly it means to have PTSD. The most frequent presentation was an endorsement of all possible symptoms (increasing from 2005 to 2008 in this military population, 20.8%-26.5%); followed by endorsement of 16 out of 17 symptoms (2% both in 2005 and 2008). These patterns were well replicated and rankings of the top combinations were fairly consistent in both data sets. These two patterns of endorsement of unique combinations may represent a combination of severity, with maximal threshold of endorsement of symptoms presented, while those with less endorsement may represent either lesser severity of PTSD presentation or a distinctly different classification schema. The pattern of endorsing all possible symptoms is common in clinical practice. The recognition of higher PCL-C scores found from this pattern of endorsement is something that clinical practice has long recognized and conjectured as to whether it reflects a severe presentation of psychological distress, an over response for reasons of possible secondary gains, and/or a call for help by the respondent. Alternatively, the unique combinations with lesser endorsement of symptom combinations may represent some variation of response to a traumatic event and further illustrate qualitatively different clusters of symptoms that would still, in the present nosology, qualify for a diagnosis of PTSD.

One can argue either (a) that the breadth of the current criterion allows one to flexibly capture what is agreed to be
PTSD or (b) so many unique clusters reflect such diverse groupings of symptoms, that the disorder has lost meaning as a useful classification schema. These findings provide an empirical response to the concern that the theoretical combinations of symptoms and their presentation in actual data are extremely large. Furthermore, these findings have significant implications for both practical and theoretical application. The findings are also thought timely given the consideration of how additional symptoms in DSM-V will impact potential use in clinical and research applications (Rosen et al., 2010).

A reasonable alternative interpretation of the results might be that the PCL-C scores instead of diversity reflect different severities of the disorder. As such, the data might allow a qualifier to be added to the DSM classification system, as a severity rating, as opposed or in addition to current codes (i.e., acute vs. chronic). The data support that at least for a military population, the endorsement of symptoms has been increasing. However, the pattern of scores has remained remarkably similar. The findings allow for a data-driven discussion of what is present in how PTSD shows up in the real world to be added to the theoretical views at this point in time. This discussion might include how the reaction to a stressor is better thought of as a dimensional response rather than a dichotomous presentation of agreed upon clusters and symptom thresholds to meet a categorical diagnosis of PTSD (Wakefield & Horwitz, 2010). However, the intent of this article was simply to illustrate that the heretofore theoretical combinations of symptoms in the present classification scheme for PTSD in fact occur in clinical presentations.

The use of PCL data contains known limits in reaching a diagnosis of PTSD. Future studies utilizing a structured interview such as the CAPS would be important to see if there are differences in how self-report data vary from endorsement of comparable items for PTSD symptoms when given by a trained interviewer (Wakefield & Horwitz, 2010; Weathers, Keane, & Davidson, 2001). However, the use of stringent criteria for probable PTSD when using the PCL-C, having both severity of endorsement and criterion clusters of symptoms, at least allows for a discussion of how people self-report posttraumatic stress symptoms. Furthermore, the use of a military population may limit generalizability to other populations. Any comparisons with other trauma populations could now be tested empirically.

Conclusion
The study has replicated the patterns of PCL-C scores in two relatively large data sets with diverse trauma histories. The findings support the concern that the theoretical possibilities of combinations in the DSM-IV symptoms needed for PTSD present in a diverse number of groupings while still meeting criterion for PTSD. The study provides a platform from which to use observations of clinically relevant data for future examination and discussions of the utility of our current classification schemas for clinical, research, and nosological applications.

Authors’ Notes
The views expressed in this manuscript are those of the authors and do not reflect the official policy or position of the Uniformed Services University, the Department of Defense, the Department of Veterans Affairs, or the U.S. Government.

Declaration of Conflicting Interests
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The authors disclosed receipt of the following financial support for the research and/or authorship of this article: Partial funding was provided by a grant from Veterans Health Administration Health Services Research and Development Research and Development Grant HFP09-156 (Edward J. Hickling and Scott D. Barnett).

References
American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.
Barlow, P., Bowman, M., & Friedlander, J. (2006). Is post-traumatic stress disorder a valid psychiatric diagnosis? Scientific Review of Alternative Medicine, 10, 36-44.
Blanchard, E. B., Jones-Alexander, J., Buckley, T. C., & Forneris, C. A. (1996). Psychometric properties of the PTSD checklist (PCL). Behaviour Research and Therapy, 34, 669-673. doi:10.1016/0005-7967(96)00333-2
Department of Defense. (2005). Survey of health related behaviors among active duty military personnel. Retrieved from http://www.ha.osd.mil/special_reports/2005_health_behaviors_survey_1-07.pdf
Department of Defense. (2008) Survey of health related behaviors among active duty military personnel. Retrieved from http://www.tricare.mil/ma/2008HealthBehaviors.pdf
Frueh, B. C., Elhai, J. D., Grubaugh, A. L., Monnier, J., Kashdan, T. B., Sauvageot, J. A., . . . Arana, G. W. (2005). Documented combat exposure of US veterans seeking treatment for combat-related post-traumatic stress disorder. British Journal of Psychiatry, 186, 467-475. doi:10.1192/bjp.186.6.467
Rosen, G. M. (2004). Traumatic events, criterion creep, and the creation of pretraumatic stress disorder. Scientific Review of Mental Health Practice Journal, 3, 46-47.
Rosen, G. M., & Lilienfeld, S. O. (2008). Posttraumatic stress disorder: An empirical analysis of core assumptions. Clinical Psychology Review, 28, 837-868. doi:10.1016/j.cpr.2007.12.002
Rosen, G. M., Lilienfeld, S. O., Frueh, C. B., McHugh, P. R., & Spitzer, R. L. (2010). Reflections on PTSD’s future in DSM-5.
Terhakopian, A., Sinaï, N., Engel, C. C., Schnurr, P. P., & Hoge, C. W. (2008). Estimating population prevalence of posttraumatic stress disorder: An example using the PTSD checklist. *Journal of Traumatic Stress, 21*, 290-300. doi:10.1002/jts.20341

Wakefield, J. C., & Horwitz, A. V. (2010). Normal reactions to adversity or symptoms of disorder? In G. M. Rosen & B. C. Frueh (Eds.), *Clinician’s guide to posttraumatic stress disorder* (pp. 33-50). Hoboken, NJ: John Wiley.

Weathers, F. W., & Keane, T. M. (2007). The Criterion A problem revisited: Controversies and challenges in defining and measuring psychological trauma. *Journal of Traumatic Stress, 20*, 107-121. doi:10.1002/jts.20297

Weathers, F. W., Keane, T. M., & Davidson, J. R. T. (2001). Clinician administered PTSD scale: A review of the first ten years of research. *Depression and Anxiety, 13*, 132-156. doi:10.1002/da.1029

Weathers, F. W., Litz, B. T., Huska, J. A., & Keane, T. M. (1994). *The PTSD Checklist–Civilian Version (PCL-C)*. Boston, MA: National Center for PTSD.

Weathers, F. W., Ruscio, A. M., & Keane, T. M. (1999). Psychometric properties of nine scoring rules for the clinician-administered posttraumatic stress disorder scale. *Psychological Assessment, 11*, 124-133. doi:10.1037/1040-3590.11.2.124

Wilson, D., & Barglow, P. (2009). PTSD has unreliable diagnostic criteria. *Psychiatric Times* (Online document). Retrieved from http://www.psychiatrictimes.com/display/article/10168/1426942

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