Association between RDoC Construct Negative Valence Domain Trajectories and Posttraumatic Stress Symptom Cluster Domain Trajectories in the Aftermath of Trauma: Results from the AURORA Study

Tishad A[1,2], An X[1,2], Ji Y[1,2], Zeng D[4] Jovanovic T[5], Stevens J[6], Ressler K[7,8], Kessler R[9], McLean SA for the AURORA Study Investigators[1,2,3]

From the [1]Institute for Trauma Recovery, [2]Department of Anesthesiology, [3]Department of Emergency Medicine, [4]Department of Biostatistics, Gillings School of Global Public Health, University of North Carolina, Chapel Hill, NC, USA [5]Department of Psychiatry and Behavioral Neurosciences, Wayne State University, Detroit, MI, USA; [6]Department of Psychiatry and Behavioral Sciences, Emory University School of Medicine, Atlanta, GA, USA; [7]Division of Depression and Anxiety, McLean Hospital, Belmont, MA, USA; [8]Department of Psychiatry, [9]Department of Health Care Policy, Harvard Medical School, Boston, MA, USA

Background

- Adverse posttraumatic neuropsychiatric sequelae (APNS) are common among civilian trauma survivors and military service members. These include posttraumatic stress (PTS), depression, post-concussion syndrome (PCS), and regional or widespread pain.
- Most contemporary studies of APNS consist of the evaluation of isolated, arbitrarily-demarcated syndromes, representing only a fragment of a trauma survivor's posttraumatic neuropsychiatric sequelae. Fundamental changes in APNS classification and study are urgently needed.
- The overarching goal of the AURORA Study is to provide a well-powered, many-layered publicly available dataset capable of helping to address the above barriers and advancing discovery. Within this overarching goal, the first aim is to identify/classify common, discrete, homogenous APNS using and/or building on the Research Domain Criteria (RDoC) classification system.
- Research domain criteria (RDoC) for the negative valence systems domain include acute threat(AT/"fear"), potential threat(PT/"anxiety"), and sustained threat(ST). We examined characteristics of, and associations between, posttraumatic recovery trajectories evaluated using RDoC negative valence domain concepts and DSM-based posttraumatic stress symptom clusters (PTSSC) (avoidance(Av), re-experiencing(Re), and hyperarousal(Ha).

Methods

- Serial posttraumatic smartphone-based and traditional survey evaluation items from a sample of AURORA study participants (n= 2626) were used to create measurement models and latent growth curves for RDoC-based and DSM-based PTSSC recovery trajectories over the first six months after trauma. Associations between latent classes and intercepts and slopes of these trajectories were assessed.

Table 1. AURORA study participant characteristics in the present sample (N=2626)

Characteristics	Frequency
Age (mean)	35.7
Female (%)	1631 (62.1%)
Income < $35,000 (%)	1471 (56%)
Education (%)	
High school or less	998 (38%)
Some college	1080 (41.1%)
College graduate	376 (14.3%)
Post graduate	172 (6.5%)

Table 2. Contents of Variables Used to Define the constructs

Construct Type	Construct	Content Type
Research Domain Criteria (RDoC) Based on survey assessments at seven time points: 30 days before ED, ED now, 2 weeks, 8 weeks, 3 months, 6 months and 12 months.	Acute Threat	Frequency of disturbing memories, feeling fear, feeling upset, bad dreams, reliving event, feeling super-alert, strong physical reactions, feeling jumpy, and sleep problems.
	Potential Threat	Frequency of awakening from sleep with anxiety, avoiding external reminders of event, bad dreams, avoiding stress experience, and feeling super-alert.
	Sustained Threat	Frequency of feeling upset, bad dreams, reliving event, loss of interest, super-alert, strong physical reactions, feeling jumpy, and sleep problems.
DSM-based Posttraumatic Stress Symptom Clusters (PTSSC) Based on short daily surveys from week 1 to week 6 and every other day from week 6 to week 12.	Avoidance	Frequency of avoiding memories, thoughts, or feelings related to the event. Frequency of avoiding external reminders of the event.
	Reexperience	Frequency of repeated, disturbing, and unwanted memories of the event. Frequency of feeling very upset of reminder of the event. Frequency of strong physical reactions at reminder of the event (i.e., heart pounding, trouble breathing, or sweating).
	Hyperarousal	Frequency of feeling "super-alert" or watchful, or on guard. Frequency of feeling jumpy or easily startled.

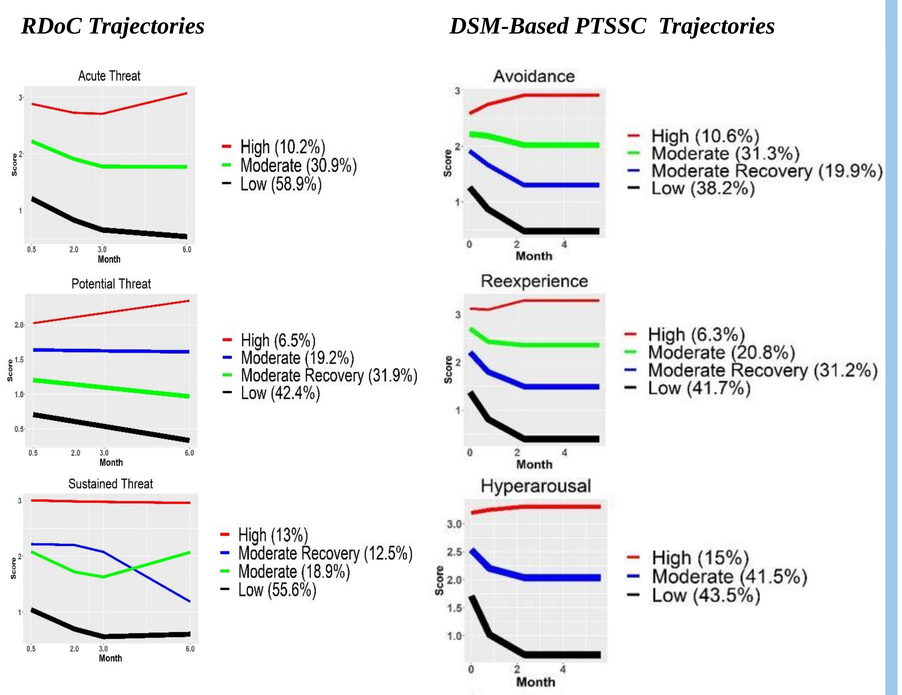

Figure 1. RDoC and DSM-based PTSSC Trajectory latent classes. Curves in each figure show the average trajectory pattern for each latent class and the percentages of participants in each latent classes are included in the legend.

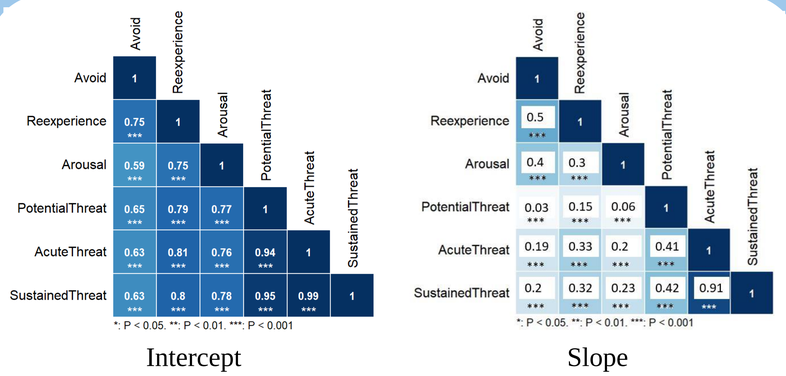

Figure 2. Correlations of Intercepts and Slopes (first slope for non-linear trajectories) of Constructs

Results

- Measurement and growth curve models provided good fit to the data. Quadratic linear functions provided the best fit to RDoC potential and sustained threat trajectory patterns. Piecewise linear functions provided the best fit to all DSM-based PTSSC trajectory patterns.
- RDoC construct intercepts were more highly intercorrelated and uniform (.94-.99), than PTSSC intercepts (Av-Re(.75), Av-Ha(.59), Re-Ha(.75)). AT, PT, and ST intercepts had very similar associations with different PTSSCs (~.80 with Re and Ha, ~.64 with Av).
- Within-PTSSC trajectories, slope associations (Av-Re(.50), Av-Ha(.3), Re-Ha(.30)) were generally weaker than intercept associations. RDoC trajectory slope terms for AT and ST were highly correlated (.91), with other within-RDoC slope associations ~.40, and weaker associations with PTSSCs.

Conclusions

- Operationalized concepts of RDoC-based and PTSSC-based constructs provide differing, complementary information, and both may be useful in studies of trauma survivors.

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