



Post-conflict struggles as networks of problems: A network analysis of trauma, daily stressors and psychological distress among Sri Lankan war survivors[☆]



Nuwan Jayawickreme^{a,*}, Candace Mootoo^b, Christine Fountain^c, Andrew Rasmussen^b,
Eranda Jayawickreme^d, Rebecca F. Bertuccio^{a,1}

^a Department of Psychology, Manhattan College, Bronx, NY, USA

^b Department of Psychology, Fordham University, New York, NY, USA

^c Department of Sociology, Fordham University, New York, NY, USA

^d Department of Psychology, Wake Forest University, Winston-Salem, NC, USA

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ABSTRACT

A growing body of literature indicates that the mental distress experienced by survivors of war is a function of both experienced trauma and stressful life events. However, the majority of these studies are limited in that they 1) employ models of psychological distress that emphasize underlying latent constructs and do not allow researchers to examine the unique associations between particular symptoms and various stressors; and 2) use one or more measures that were not developed for that particular context and thus may exclude key traumas, stressful life events and symptoms of psychopathology. The current study addresses both these limitations by 1) using a novel conceptual model, network analysis, which assumes that symptoms covary with each other not because they stem from a latent construct, but rather because they represent meaningful relationships between the symptoms; and 2) employing a locally developed measure of experienced trauma, stressful life problems and symptoms of psychopathology. Over the course of 2009–2011, 337 survivors of the Sri Lankan civil war were administered the Penn-RESIST-Peradeniya War Problems Questionnaire (PRPWPQ). Network analysis revealed that symptoms of psychopathology, problems pertaining to lack of basic needs, and social problems were central to the network relative to experienced trauma and other types of problems. After controlling for shared associations, social problems in particular were the most central, significantly more so than traumatic events and family problems. Several particular traumatic events, stressful life events and symptoms of psychopathology that were central to the network were also identified. Discussion emphasizes the utility of such network models to researchers and practitioners determining how to spend limited resources in the most impactful way possible.

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There are currently 65.3 million people who have been displaced by violent conflict and humanitarian disasters, the largest number since the mid-1990s (United Nations High Commission for Refugees, 2016). Numerous studies have documented that refugees and other displaced populations suffer from high rates of emotional

distress, which stem from their experience of war trauma (e.g., Neuner and Elbert, 2007) and other stressors related to forced displacement (for a review, see Fazel et al., 2005). However, there remains a lack of consensus among practitioners and researchers who work with conflict-affected populations on how best to conceptualize and address their mental health needs (van Ommeren et al., 2005). Practitioners in the field have observed a wide variety of patterns of stressors and distress across different war-affected populations (e.g., Jones and Kafetsios, 2002). Conversely, researchers have typically conceptualized the relationship between stressors and distress as a more limited stressors-distress equation, in which each side of the equation is typically collapsed into a small number of constructs. Stressors are usually

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* Corresponding author. Department of Psychology, Manhattan College, Bronx, NY 10471, USA.

E-mail address: nuwan.jayawickreme@manhattan.edu (N. Jayawickreme).

¹ Rebecca F. Bertuccio is now at the Department of School Psychology, Pennsylvania State University, State College, PA.

operationalized as a set of composite causal indicators (usually scores on a traumatic event checklists, but increasingly inclusive of other types of stressors), and distress usually a set of latent variables reflected by responses to psychological symptom items (often scores from posttraumatic stress disorder [PTSD] or depression questionnaires) on the other. The current study takes a relatively novel approach to this problem, conceptualizing and visualizing traumatic events, other stressors, and distress as nodes in a network of problems. Although the visualization of data points in multidimensional space has a number of time-testing precedents (e.g., Smallest Space Analysis; Guttman, 1968), in psychology network approaches are relatively new (Armour et al., 2017; Borsboom and Cramer, 2013; McNally, 2012); only one previous study has included both stressors and distress in a network model within a war-affected population (De Schryver, Vindevogel, Rasmussen & Cramer, 2015).

Conceptualizing psychological symptoms as reflecting underlying latent constructs has several drawbacks. First, these models rest on the assumption that symptoms reflect underlying latent constructs, and therefore do not allow researchers to examine the unique associations between particular stressors and particular symptoms (or even sets of symptoms). Second, latent constructs are indicated by sets of symptoms, which means that symptoms that are not correlated with others will be excluded—without regard for potentially important bivariate associations with stressors (Layne et al., 2010). This situation limits the variability that can be observed on the emotional distress side of the stressor-distress equation, not allowing for the full range of potential patterns reported by practitioners in the field. Finally, latent variable models also violate basic statistical assumptions concerning the local independence of their indicators (Borsboom and Cramer, 2013).

As a solution to violation of local independence in latent variable models, several researchers have proposed that sets of symptoms be modeled as causal networks of concrete indicators (Borsboom and Cramer, 2013). Network approaches assume that symptoms are variables that indicate only themselves. This does not preclude the discussion of broader psychological constructs—e.g., diagnoses—but rather posits that these broader constructs are best conceptualized as sets of autonomous phenomena (i.e., symptoms) arranged in networks of problems, perhaps even as causal chains of such problems (Schmittmann et al., 2013). For example, PTSD might be conceptualized as a set of symptoms meaningfully related to one another—e.g., trauma-related nightmares causing sleep difficulties which in turn cause anger or irritability—rather than in a somewhat vague association between intrusion, avoidance, negative alterations in cognitions and mood, and hyperarousal (McNally, 2012; McNally et al., 2015). Notably, modeling sets of symptoms as causal networks better reflects much short-term clinical practice, in which clinicians focus on alleviating symptoms that seem to be at the root of other symptoms.

In network models of psychological distress, each symptom is a node, and covariance between symptoms is represented as ties between nodes. Ties may be binary (i.e., symptoms covary or do not) or weighted according to the strength of their covariance. Association networks are based on correlations between nodes, and concentration networks on partial correlations in order to account for background association between nodes in association networks (McNally, 2012). Nodes' prominence within networks is observed by calculating their centrality. Centrality refers to a related set of measures that capture information about the roles of individual nodes in the network and involves the number, weight, and pattern of ties associated with each node. If an individual endorses a particular node that is central, then the probability of that individual endorsing other nodes is greater than if the individual endorses a node that is peripheral to the network (Fried et al.,

2017). Visualizing networks allows researchers to note relative placements of nodes, which indicate central or peripheral roles within networks.

If we accept that both sides of the stressors-distress equation can be composed of diverse and autonomous conceptual entities, it is not a stretch to conceptualize a causal network between these entities. In other words, consistent with social ecological models in psychology (e.g., Bronfenbrenner, 1977; Moos, 1984), a network approach allows various traumatic events, other stressors and symptoms to be linked to one another, illustrating patterns that may better reflect individuals' emotional experience of distress in the context of traumas and other stressors. De Schryver et al. (2015) argued for such an approach and have provided the only demonstration to date of how network analysis can identify relationships between traumatic events, stressors and symptoms. De Schryver et al. (2015) examined ties between stressful wartime events, daily stressors, and PTSD symptoms in a conflict-affected Ugandan sample. Their network revealed that although symptoms clustered closely together on one side in a subnetwork and stressful wartime events and daily stressors clustered closely on the other, there were several important intermediary nodes connecting the two subnetworks. In addition, there was considerable variety in centrality, with traumatic wartime events and daily stressors having greater centrality on average than symptoms.

Network science findings so far are consistent with several established theoretical approaches describing how multiple types of losses and stressors result in multiple forms of distress. The most prominent of these is Conservation of Resources (COR) theory (Hobfoll, 1989, 2001), which proposes that stress results from perceived loss or potential loss. If one's losses are large—as is often the case among survivors of war—then one has fewer remaining resources that could be used to protect against further loss. COR theory predicts that losses (and trauma, which often represents loss) often interact in loss spirals, i.e., cascading stressors that result in considerable psychological distress (Hobfoll, 2001). COR theory has substantial support in war-affected populations, including Sri Lanka (e.g., Mattock, 2005; Siriwardhana et al., 2013; Somasundaram and Sivayokan, 2013; Witting et al., 2016). Other similar theories with empirical support include the daily stressors model, in which the effects of war-related trauma on psychological distress are mediated and moderated by frequent stressors and stressful conditions (Miller and Rasmussen, 2010, 2014; 2017). It is not our intention in the current study to somehow propose new theory via network science, only to present findings using alternative methods.

In the current study, we applied network science methods to understand how war trauma, daily stressors and symptoms of mental distress interacted to create local networks of problems in survivors of the Sri Lankan civil war (E. Jayawickreme, Jayawickreme and Miller, 2010). The war, which lasted from 1983 to 2009, was fought primarily between the armed forces of the Sri Lankan government and the Tamil separatist group, the Liberation Tigers of Tamil Eelam (LTTE) and resulted in the deaths of at least 100,000 people and the displacement of a further 800,000 (Vhurumuku et al., 2012). Civilians caught in the conflict experienced devastating losses, including shelling, aerial bombardment, food and water shortages, loss of shelter, loss of employment, loss of material goods, rape, torture, and forced recruitment into the LTTE (Harrison, 2012). Seven years after the end of the war, over 45,000 internally displaced individuals remain in Sri Lanka, many living in desperate conditions (United Nations High Commission for Refugees, 2016).

In the current study, symptoms of psychological distress, experienced war trauma and daily stressors were assessed using a locally developed measure, the Penn-RESIST-Peradeniya War

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