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Network Analysis of Posttraumatic Stress Experiences of Adults Seeking Psychological Treatment for Childhood Sexual Abuse

Orla McBride,[1] Philip Hyland,[2] Jamie Murphy,[1] and Ask Elklit[3]
[1]School of Psychology, Ulster University, Cromore Road, Coleraine, Co. Londonderry, Northern Ireland, BT52 1SA, United Kingdom
[2]Department of Psychology, Maynooth University, Maynooth, Co. Kildare, Ireland
[3]National Centre for Psychotraumatology, Department of Psychology, University of Southern Denmark, Campusvej 55 Odense M, DK-5230, Denmark

Network analysis proposes that mental disorders may best be construed as causal systems embodied in networks of functionally interconnected symptoms. We employed network analysis to test how adult survivors of childhood sexual abuse (CSA) experienced symptoms of posttraumatic stress, using alternative conceptualizations of posttraumatic stress disorder (PTSD). Given the characteristics of the sample (i.e., the nature of and time since trauma), we hypothesized that (a) symptoms related to arousal would not be prominent in the networks and (b) symptoms related to negative alternations in cognition and mood (NACM) would be core components in the network. Danish adults seeking psychological treatment for CSA ($n = 473$) completed the Harvard Trauma Questionnaire and Trauma Symptom Checklist. Three alternative models (*DSM-5*, *DSM-5* with dissociation, and *ICD-11* complex PTSD [CPTSD]) were estimated using regularized partial correlation models. In the *DSM-5* network, strong associations emerged for experiences of NACM (blame and guilt) and intrusions (thoughts and flashbacks). The addition of "depersonalization" and "derealization" to the *DSM-5* model produced a strong association, but these experiences were largely unrelated to other PTSD clusters. In the CPTSD network, interpersonal problems and negative self-concept were central to the survivors' experiences. For this highly-specific survivor group who experienced traumatic CSA many years ago, experiences related to NACM appeared to be more central to the posttrauma experience than those of arousal. If replicated, these findings could help inform treatment plans for specific groups of survivors. Methodological implications as to the usefulness of network models in the psychopathological research literature are discussed.

The disease model of psychopathology, which proposes that "disorders," such as posttraumatic stress disorder (PTSD), are manifested by "symptoms," such as avoidance, hyperarousal, and recurrent nightmares (Borsboom, Cramer, Schmittmann, Epskamp, & Waldorp, 2011), is inherently problematic. First, for this model to hold, it should be possible to separate conceptually the condition (e.g., PTSD) from its symptoms (e.g., hyperarousal). In the absence of robust evidence, such as key genetic markers or neural abnormalities, as to the root cause of mental disorders (Kendler, 2005), the main indicators of psychological distress are a list of "symptoms" outlined in psychiatric classification systems. It is not possible to be diagnosed with PTSD independent of symptoms that are intrusive or related to cognitive function, which are core symptoms for a diagnosis per the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*) or *International Classification of Diseases* (*ICD*). Second, in a latent variable modeling framework, the assumption of local independence must be satisfied; that is, observed variables are assumed to be statistically independent conditional on the latent variable (Borsboom, 2008). This assumption means that symptoms such as difficultly sleeping, hyperarousal, and recurrent nightmares co-occur within an individual only because they are all caused by a condition called PTSD and not because they are causally related. For many disorders, including PTSD, this seems to be an implausible assumption (Cramer et al., 2012).

If it is assumed that the associations between the observable components of psychological constructs such as PTSD are real (Cramer et al., 2012), then mental disorders may best be construed as causal systems embodied in networks of functionally interconnected symptoms (McNally et al., 2014). Network analysis, which conceptualizes symptoms as constitutive of the mental disorder rather than as a reflection of

Correspondence concerning this article should be addressed to: Orla McBride, PhD, School of Psychology, Ulster University, Cromore Road, Coleraine, Co. Londonderry, Northern Ireland, BT52 1SA United Kingdom. E-mail: o.mcbride@ulster.ac.uk

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a latent entity (Robinaugh, LeBlanc, Vuletich, & McNally, 2014), has gained attention in recent years (see Cramer et al., 2012).

McNally and colleagues (2014) generated a network model of PTSD using data from a sample of Chinese earthquake survivors who had a diagnosis of probable PTSD ($n = 362$; 73% women). The results identified that (a) hypervigilance was central to the network, meaning it was a core feature of the survivors' experience; (b) "feelings that one's future will be cut short" acted as a bridge that connected both hypervigilance and intrusive memories with emotional numbness, and, in turn, with feelings of social disconnection and anhedonia; (c) there was bidirectionality between experiences; for example, hypervigilant survivors were prone to startle, which served to promote continued hypervigilance and thus increased the chronicity of the disorder; (d) irritability/anger was linked to sleep and concentration problems; and (e) intrusive thoughts, flashbacks, and nightmares were all connected, but physiological and emotion reactions to reminders of the trauma were not. Studies that have followed this pioneering work have produced varying results. For example, Sullivan, Smith, Lewis, and Jones (2016) found less support for the centrality of hypervigilance in a network of posttrauma experiences among university students who had witnessed an on-campus mass shooting but stronger evidence for the role of intrusive thoughts and anger. In a sample of U.S. veterans diagnosed with probable PTSD, Armour, Fried, Deserno, Tsai, and Pietrzak (2017) reported that experiences associated with guilt, shame, flashbacks, and reactivity to trauma reminders were central to the network.

Although recent work has indicated that the structures of PTSD networks across heterogeneous treatment-seeking samples have patterns of symptoms in common (Fried et al., 2018), it is plausible that the configuration of a posttrauma network may depend on the type of trauma that was experienced and duration of time since the trauma (Roberts, Gilman, Breslau, Breslau, & Koenen, 2011). Much evidence has alluded to the role that arousal in the short-term aftermath of a violent trauma plays in increasing the likelihood for PTSD (Schell, Marshall, & Jaycox, 2004). Symptoms from other clusters, mainly avoidance, tend to occur following periods of excessive arousal and reexperiencing (O'Donnell, Elliott, Lau, & Creamer, 2007) in an attempt to establish cognitive equilibrium, which may be maladaptive and promote dysfunction (Clark & Beck, 2011). Negative alterations in cognition and mood (NACM), including guilt, might be particularly prevalent among individuals who have been sexually abused (Kubany & Manke, 1995), perhaps partly due to the personally invasive nature of this trauma type. In this study, we used network analysis to assess the PTSD experiences of adults seeking psychological treatment for childhood sexual abuse (CSA). We modeled alternative conceptualizations of PTSD as per the fifth edition of the *DSM* (*DSM-5*) and complex PTSD (CPTSD) as per the 11th revision of the *ICD* (*ICD-11*), the latter of which acknowledges that disturbances in self-organization (DSO) are evident among individuals who have experienced chronic and repeated trauma (Cloitre, Garvert, Brewin, Bryant, & Maercker, 2013), to test two hypotheses: (a) symptoms related to arousal would not be prominent in the networks and (b) symptoms of NACM would be central components of the networks.

Method

Participants and Procedure

Data were collected from adult attendees ($N = 484$) at four Danish treatment centers that provide psychological treatment for CSA victims. Further details on the study are available elsewhere (Elklit, Christiansen, Palic, Karsberg, & Eriksen, 2014). Briefly, the treatment centers are supported by Denmark's Ministry of Social Affairs. Treatment exclusion criteria were (a) a current alcohol or drug problem, (b) a psychotic or personality disorder, (c) self-harming behavior, and (d) engagement in treatment elsewhere. Clients who met the exclusion criteria were referred either to specialized institutions or to voluntary help groups. Approval for the use of this data was obtained from the relevant ethical boards at the University of Southern Denmark (IRB approval: j.nr.2014-54-0853). Gender was recorded for 98.1% of the sample ($n = 407$ women; 84.1%), age was recorded for 97.3% ($M = 36.4$ years, $SD = 10.6$), and years since the end of abuse was recorded for 59.3% ($M = 22.5$ years, $SD = 11.8$).

Measures

Traumatic experiences. The 30-item Harvard Trauma Questionnaire-Part III (HTQ; Mollica et al., 1992) was used to assess the occurrence of trauma-related symptoms, which respondents rate on a 4-point Likert scale (1 = *not at all* to 4 = *mostly*); in the current study, only 20 items were used to assess the occurrence of *DSM-5* PTSD symptoms in the past month (see Table 1). The Danish version of the HTQ has produced reliable and valid scores (Bach, 2003). Reported HTQ ratings according to the third edition (text revision) of the *DSM* (*DSM-III-R*) diagnostic criteria of PTSD have shown an 88.0% concordance with interview-based estimates of PTSD (Mollica et al., 1992).

Trauma symptoms. The Trauma Symptom Checklist (TSC; Briere & Runtz, 1989) is a 33-item questionnaire used to assess general psychological distress. Respondents score answers on a 4-point Likert scale (1 = *never* to 4 = *always*). The Danish version of the TSC has been used in a wide range of trauma populations with reports of good reliability and validity (Elklit, 1990). In the present study, only eight items were used to measure *DSM-5* PTSD and *ICD-11* Complex PTSD (see Table 1).

Table 1
Items From the Harvard Trauma Questionnaire (HTQ) and Trauma Symptom Checklist (TSC) Mapped to the DSM-5 and ICD-11 Conceptualization of Posttraumatic Stress Disorder (PTSD) and Associated Response Frequencies for Danish Treatment-Seeking Adult Survivors of Childhood Sexual Abuse

			Frequencies-Analytic Sample[d] ($n = 473$)							
			Not At All		Rarely		Sometimes		Mostly	
Node Label	PTSD Experience	Questionnaire Item	*n*	%	*n*	%	*n*	%	*n*	%
Thoughts[a,b]	Recurrent thoughts	HTQ1	32	6.8	84	17.9	246	52.5	107	22.8
Nightmare[a,b,c]	Recurrent nightmares	HTQ3	134	28.8	127	27.3	124	26.7	80	17.2
Flashback[a,b,c]	Feel event happening again	HTQ2	124	26.4	146	31.1	161	34.3	39	8.3
Physical[a,b] _ Psychological[a,b]	Sudden physical/psychological reaction	HTQ16	25	5.3	91	19.4	175	37.3	178	38.0
Avoid feelings[a,b,c]	Avoid thoughts or feelings of trauma	HTQ15	49	10.5	76	16.3	165	35.5	175	37.6
Avoid activities[a,b,c]	Avoid activities that remind of trauma	HTQ11	85	18.5	88	19.1	102	22.2	185	40.2
Remember[a,b]	Inability to remember parts of trauma	HTQ12	64	13.9	69	15.0	139	30.2	189	41.0
Future[a,b]	Feeling as if don't have future	HTQ14	93	19.9	94	20.1	160	34.3	120	25.7
Blame[a,b]	Blame yourself for things that happened	HTQ19	135	29.1	91	19.6	137	29.5	101	21.8
Shame[a,b,e]	Feel ashamed about things that happened	HTQ23	73	15.6	116	24.7	191	40.7	89	19.0
Guilt survived[a,b,e]	Feel guilt for having survived	HTQ21	48	10.4	92	19.9	208	44.9	115	24.8
Guilt not doing[a,b,e]	Feel guilt not doing enough	HTQ31	90	19.4	88	18.9	145	31.2	142	30.5
Interest[a,b]	Less interest in daily activities	HTQ13	51	10.9	129	27.7	199	42.7	87	18.7
Detached[a,b]	Feel detached or withdrawn from people	HTQ4	48	10.3	73	15.6	190	40.7	156	33.4
Emotion[a,b]	Unable to show emotions	HTQ5	90	19.1	122	26.0	195	41.5	63	13.4
Irritable[a,b]	Feeling irritable or outbursts of anger	HTQ10	25	5.3	78	16.7	210	44.9	155	33.1
Reckless[a,b]	Want to harm yourself physically	TSC21	290	62.2	125	26.8	29	6.2	22	4.7
Guard[a,b,c]	Feeing on guard	HTQ9	24	5.1	54	11.6	163	4.9	226	48.4
Jumpy[a,b,c]	Feeling jumpy	HTQ6	51	10.9	106	22.6	135	28.8	177	37.7
Concentrate[a,b]	Difficulty concentrating	HTQ7	19	4.0	65	13.8	202	43.0	184	39.1
Sleep[a,b]	Trouble sleeping	HTQ8	58	12.3	70	14.9	129	27.4	214	45.4
Depersonalization[b]	Feel as if you are outside your body	TSC32	172	37.3	160	34.7	76	16.5	53	11.5
Derealization[b]	A sense of unreality	TSC30	120	25.9	173	37.4	105	22.7	65	14.0
Temper[c]	Temper outburst you could not control	TSC16	143	30.4	195	41.5	67	14.3	65	13.8
Cry[c]	Crying easily	TSC14	95	20.2	201	42.8	102	21.7	72	15.3
Isolated[c]	Feelings of inferiority or insecurity	TSC28	43	9.2	167	35.9	131	28.2	124	6.7
Blame[c]	Blaming yourself	TSC29	53	11.5	142	30.7	147	31.8	120	26.0
Insecure[c]	Feeling isolated from others	TSC6	72	15.4	181	38.6	129	27.5	87	18.6
Rely on[c]	Feeling that you have no one to rely upon	HTQ27	67	14.3	100	21.4	172	36.8	129	27.6

Note. Minimal levels of missing data across response categories; valid percentage reported. *DSM-5 = Diagnostic and Statistical Manual of Mental Disorders* (5th ed.); *ICD-11 = International Classification of Diseases* (11th rev.).
[a]Network 1 = *DSM-5* PTSD. [b]Network 2 = *DSM-5* PTSD with dissociative experiences. [c]Network 3 = *ICD-11* Complex PTSD. [d]Corresponding response categories for TSC: *never*; *yes, sometimes*; *yes, often*; and *yes, very often*. [e]In *DSM-5*, these items are combined to reflect a single criterion, *negative emotional state*; for the purposes of this study, these items were modeled as separate experiences.

Data Analysis

Adults with complete missing data on all questionnaire items ($n = 11$; 2.3% of the sample) were excluded. Three alternative PTSD networks were estimated in stages, using items from across the HTQ and TSC (see Table 1): (a) Network 1: *DSM-5* (21 items), (b) Network 2: *DSM-5* with dissociation (23 items, as per Hansen, Műllerová, Elklit, and Armour, 2016), and (c) Network 3: *ICD-11* CPTSD (12 items, as per Cloitre et al., 2013).

Stage 1: Network estimation and visualization. *Edges* (the association between two symptoms) were calculated by computing polychoric correlations between *nodes* (questionnaire items) using the state-of-the-art Pairwise Markov Random

Field (PMRF; Epskamp, Borsboom, & Fried, 2016; Epskamp & Fried, 2016) for ordinal data, known as the Gaussian graphical model (GGM; Costantini et al., 2015; Lauritzen, 1996). Gaussian graphical model networks estimate a large number of parameters (e.g., 20 nodes require the estimation of 210 parameters: 20 threshold parameters and $20 \times 19/2 = 190$ pairwise association parameters) that likely result in some false-positive edges. Epskamp and colleagues (2016) directed that the least absolute shrinkage and selection operator (LASSO; Tibshirani, 1996)—a form of regularization which causes small connections to shrink to be exactly zero—be applied to construct a simple, parsimonious model. A well-established and fast algorithm for estimating LASSO regularization is the graphical LASSO (*glasso*; Friedman, Hastie, and Tibshirani, 2008), which is implemented in the R package *qgraph* (Epskamp, Cramer, Waldorp, Schmittmann, & Borsboom, 2012; Friedman, Hastie, & Tibshirani, 2014). *Qgraph* utilizes *glasso* in combination with the extended Bayesian information criterion (EBIC; Chen & Chen, 2008) model selection to estimate a regularized GGM. The absence of an edge in this network indicates that two nodes are conditionally independent given all other nodes in the network (Costantini et al., 2015). For network visualization in gray scale, positive associations are full lines and negative associations are dashed. Thicker lines represent stronger connections and thinner lines represent weaker connections. Associations between PTSD indicators estimated in the networks are weighted but not directed, reflecting the magnitude of the association only. *Qgraph* implements the Fruchterman and Reingold (1991) algorithm, which positions strongly correlated nodes together.

Stage 2: Centrality estimation. Centrality, which reflects how connected a symptom is in a network, is indicated by three indices of node: strength, closeness, and betweenness (Opsahl, Agneessens, & Skvoretz, 2010). Centrality indices are presented as standardized values. Items high in node strength, a measure of the sum of the weights of the edges (i.e., correlation magnitudes), are likely to exert strong direct influence over other nodes in the network. Closeness represents the average distance between a given node and the remaining nodes in the network; this may determine which PTSD symptoms are likely to be quickly affected by changes in other symptoms. The betweenness index reflects how important that node is for transmitting effects between other nodes in the network. Removal of items with high betweenness from a network increases the distance of other paths in the network (Costantini et al., 2015). High values on the centrality measures, which are presented graphically in *qgraph*, reflect a node's greater importance to the network.

Stage 3: Accuracy and stability estimation. We used the *bootnet* package in R to test the stability and accuracy of the networks (Epskamp et al., 2016; Fried & Cramer, 2016). This analysis is necessary to determine the certainty with which the rank ordering of the edge weights and centrality indices can be interpreted. Specifically, we investigated the accuracy of the edge weights by constructing 95% confidence intervals (CI) around the edges and calculated the edge weights difference test that estimates whether edge weights differ from each other significantly. Further, we estimated the stability of the order of the estimation by subsetting bootstrap (i.e., dropping participants and reestimating the network); if the order of the centrality estimates obtained from a network with substantially fewer participants is highly correlated to those obtained from a network analysis of all participants, the centrality estimates are viewed as stable. The centrality stability (CS) coefficient should be at a minimum 0.25, but preferably 0.5 or higher (Epskamp et al., 2016).

Results

Preliminary Analyses

The distributions of HTQ and TSC items satisfied skewness criteria for normality. As presented in Table 1, experiences of arousal, such as hypervigilance, occurred frequently, whereas experiences related to self-destructive behavior occurred less so.

Network 1: *DSM-5*

Visual inspection (Figure 1, Panel A) revealed several strong positive correlations between thoughts, flashbacks, and physical–psychological reactions as well as between these items and experiences of shame and avoid activities. Guilt survived and future were strongly associated with each other as were guilt not doing and blame, but these items were not associated with other experiences in the NACM cluster. Weaker associations emerged between guard and jumpy and the items sleep and concentrate. Remember was positively associated with emotions. The results of the accuracy and stability testing for this network (see Supplementary Materials) indicated substantial interrelatedness, with correlations of .75 between node strength and closeness, .73 between node strength and betweenness, and .80 between closeness and betweenness. Moreover, CS coefficients for node strength, closeness, and betweenness were .51, .36, and .21, respectively. Combined, these findings justified a focus on the stable estimates of node strength and closeness in the main report, with the findings related to betweenness relegated to the Supplementary Material. Figure 2 (Panel A) presents standardized centrality estimates; the five nodes with the highest centrality indices were flashbacks, future, guilt survived, detached, and nightmares. Nightmares (Node 2) had a strong strength index but also the highest closeness estimate across all experiences. Irritable and remember produced the lowest estimates across both centrality indices.

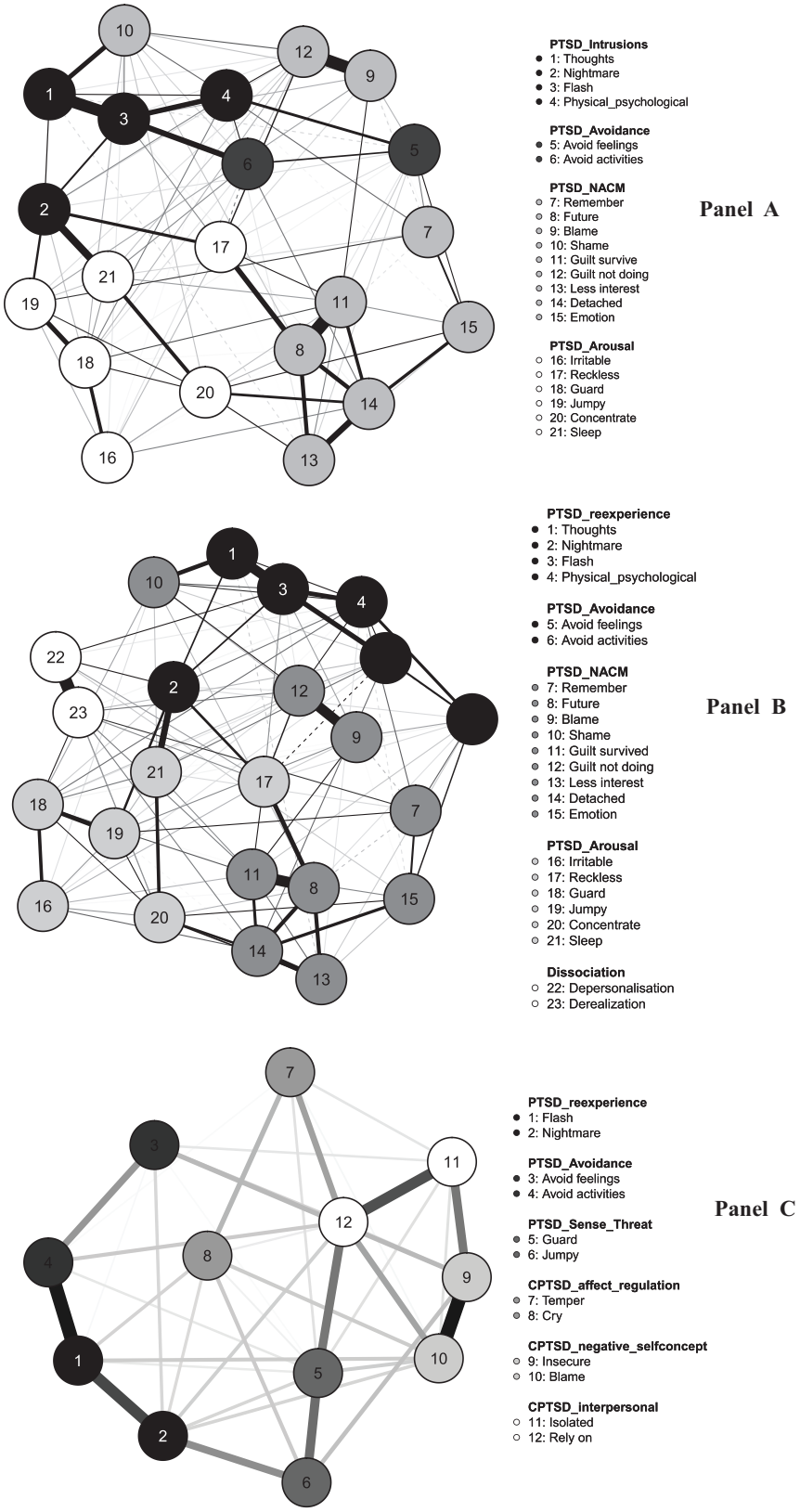

Figure 1. Gaussian graphical model (GGM) networks of Harvard Trauma Questionnaire and Trauma Symptom Checklist items depicting a *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5* [Panel A]), *DSM-5* with dissociation (Panel B), and *International Classification of Diseases* (11th rev.) complex posttraumatic stress disorder (CPTSD [Panel C]) experiences among adult survivors of childhood sexual abuse ($n = 473$). PTSD = posttraumatic stress disorder; NACM = negative alterations in cognition and mood.

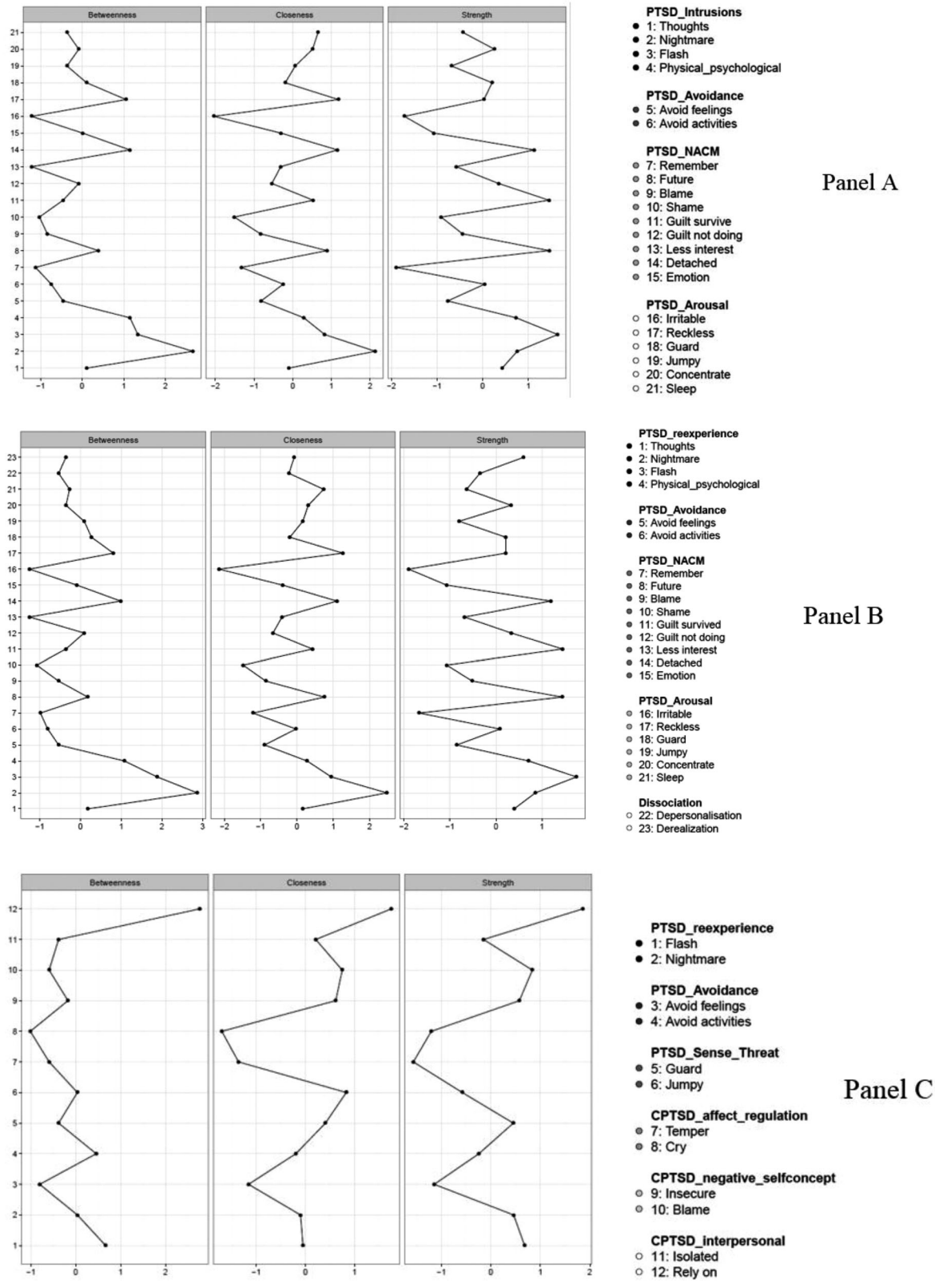

Figure 2. Centrality estimates from Gaussian graphical model (GGM) network of Harvard Trauma Questionnaire and Trauma Symptom Checklist items depicting a *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5* [Panel A]), *DSM-5* with dissociation (Panel B), and *International Classification of Diseases* (11th rev.) complex posttraumatic stress disorder (CPTSD [Panel C]) experiences among adult survivors of childhood sexual abuse ($n = 473$). PTSD = posttraumatic stress disorder; NACM = negative alterations in cognition and mood.

Network 2: *DSM-5* (With Dissociation)

The strongest positive associations emerged between depersonalization and derealization, with weaker associations evident between these items and other experiences (Figure 1, Panel B). Depersonalization was associated mainly with the experiences nightmares and flashbacks, whereas derealization was mainly associated with experiences in the arousal and NACM clusters (e.g., concentrate and remember). As outlined in the Supplementary Materials, the CS coefficients for node strength, closeness, and betweenness were .52, .28, and .21, respectively. The rank ordering of the strongest edges changed from Network 1 to Network 2; specifically, the edge weight between derealization and depersonlization was ranked first, followed by future and guilt survived (second; first in Network 1), blame and guilt not doing (third; second in Network 1), and thoughts and flashbacks (fourth; third in Network 1). Of the pair, depersonalization had the strongest strength index but was weaker than the top five nodes in Network l (Figure 2, Panel B).

Network 3: *ICD-11* CPTSD

The strongest associations emerged between rely on and isolated as well as insecure and blame; the association between temper and cry was weaker (Figure 1, Panel C). The CS coefficients for node strength, closeness, and betweenness were .59, .28, and .13, respectively (see Supplementary Materials). Nodes that reflected affect regulation had the lowest strength estimates, which raised concerns about their importance in the network. Alternatively, rely on was the most important experience in this network (Figure 2, Panel C).

Discussion

The findings from this study, which sought to understand and explain the core experiences of adult survivors of CSA trauma from a network perspective, can be summarized succinctly. Strong associations between the three pairs of experiences emerged: future and guilt survived, blame and guilt not doing, and thoughts and flashbacks. When depersonalization and derealization were included in the network, the strength of this association outranked the three aforementioned associations. Depersonalization in particular was an important element of the posttrauma experience. In the CPTSD network, interpersonal problems and negative self-concept (i.e., DSO) seemed to be core elements of the posttrauma experience, whereas difficulties regulating mood were less so. Collectively, these findings suggest support for the study's hypotheses. Before a detailed discussion of the findings, some study limitations are worth mentioning. Survivors were predominantly female, educated, married, in middle adulthood, and free from substance use problems and other mental health difficulties; these characteristics preclude generalizability of this study's findings to other trauma groups. Experiences of PTSD were assessed at one time point in adulthood, which was, for most individuals, many years after the trauma had ended. Although there are ongoing efforts to develop a measure of ICD-11 CPTSD (e.g., the International Trauma Questionnaire; Hyland et al., 2017), this study was limited to approximating CPTSD using items from other measures. Given the cross-sectional study design, we were unable to determine whether the most central experiences activated other experiences or were activated by other experiences, or whether a reciprocal association was the most plausible explanation. Finally, the sample size could be perceived as merely adequate for estimating a network with 23 nodes.

The findings of this paper, which relate to a highly specific trauma survivor group, indicated that, many years following traumatic CSA, experiences relating to NACM appear more central to the posttrauma experience than experiences of arousal. If replicated elsewhere, this may have an important clinical implication: In the immediate to short-term aftermath of a trauma, clinical interventions that focus on reducing physiological and psychological arousal may be most effective, whereas in the long-term, clinical interventions that focus on modifying dysfunctional cognitive and/or emotional factors may be required. It was interesting to note that the two dissociation experiences were highly associated with one another but relatively isolated from all other PTSD symptoms. On one hand, this finding could be interpreted as an indication of support for the notion of a PTSD subtype (Armour, Karstoft, & Richardson, 2014; Lanius et al., 2014). On the other hand, it may indicate that these symptoms have little in common with the other PTSD symptoms and therefore their inclusion within a PTSD profile could be questioned (Cloitre et al., 2013; Maercker et al., 2013).

Finally, we focused our attention on the suitability of network analysis to identify the PTSD experiences of Danish adults. Despite a growing number of studies that have used this modeling framework (Afzali et al., 2017; Bryant et al., 2017), critics contest that the methodology is in its infancy and there should be legitimate concerns about the approach (Ashton & Lee, 2012). In response, we note that the findings of the current (and past) network models suggest a considerable degree of similarity to traditional latent variable models of PTSD. For example, in each of the current networks, the PTSD symptoms cluster in a manner that largely reflects the four-factor model in the *DSM-5* (American Psychiatric Association, 2013), the dissociative subtype, and the six-factor model of *ICD-11* (World Health Organization, 2018) CPTSD. The network approach offers no obvious explanation for why the intrusions, avoidance, NACM, arousal, and dissociative symptoms are intra- and interrelated in the manner in which they are. Indeed, if latent variable models were incorrect and PTSD symptoms were simply related to one another in a causal network with no underlying latent structure, it would seem improbable that these symptoms should cluster together in a consistent manner across multiple studies and much less so in a manner similar to what has been evidenced in the latent variable modeling literature. Of course, the current results indicate that the symptoms are not clustering in a

manner that perfectly reflects the four-factor model of *DSM-5* PTSD (e.g., Items 9, 10, and 12 are disconnected from the rest of the NACM symptoms, and some of the arousal symptoms are unconnected to one another; APA 2013). The current, and prior, findings could be used as a potential exploratory approach to identify symptom covariation patterns that could aid in the development of new factorial models of psychiatric disorders. Furthermore, the network approach seems useful in terms of identifying "core symptoms" of a given disorder and thus useful for item and/or symptom reduction purposes. Consider, for example, two arousal items in this study that were strongly connected (guard and jumpy) but largely unrelated to the other arousal symptoms. These two items were selected by the ICD-11 Working Group for Trauma and Stress-Related Disorders as the core hyperarousal symptoms to be included within the recently published *ICD-11* model of PTSD (Karatzias et al., 2017). The results of the current study, and those of McNally et al. (2014), support the notion that these two items are distinct measures of hyperarousal. Thus, rather than viewing network analysis and latent variable models as competing methodologies for understanding psychopathology, it may be possible instead to consider both as complimentary techniques that achieve and reveal more together than they do separately.

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