

Supplementary Material

Article Title: Identifying Bridge Symptoms Between Borderline Personality Disorder and Posttraumatic Stress Disorder: A Network Analysis From a National Cohort

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Supplementary material

Supplementary Table 1. DSM-IV criteria for BPD and PTSD, their corresponding abbreviations used in the present study and their prevalence among respondents in the study population.

Disorder	DSM-IV Criterion	Item Label	Symptom	Prevalence (%)	Prevalence (number of subjects)
BPD		BPD1	Marked reactivity of mood	7.09	2458
		BPD2	Chronic feelings of emptiness	10.46	3625
		BPD3	Identity disturbance	17.14	5939
		BPD4	Frantic efforts to avoid real or imagined abandonment	12.53	4341
		BPD5	Extremes of idealization and devaluation	18.42	6384
		BPD6	Impulsivity	28.65	9927
		BPD7	Inappropriate anger	15.63	5415
		BPD8	Transient paranoid ideation or severe dissociative symptoms	8.84	3063
		BPD9	Self-harm or suicidal gestures	4.04	1401
PTSD	Traumatic exposure	PTSD1.1	Experienced, witnessed, or was confronted with traumatic event	43.93	15222
		PTSD1.2	Response involved intense fear, helplessness, or horror	60.9	21105
	Intrusion	PTSD2.1	Recurrent and intrusive distressing recollections of the event	48.88	16939
		PTSD2.2	Recurrent distressing dreams of the event	22.65	7848
		PTSD2.3	Acting or feeling as if the traumatic event were recurring	18.4	6376
		PTSD2.4	Intense psychological distress at exposure to cues	27.6	9565
		PTSD2.5	Physiological reactivity on exposure to cues	19.41	6726
	Avoidance	PTSD3.1	Efforts to avoid thoughts, feelings, or conversations	34.97	12119
		PTSD3.2	Efforts to avoid activities, places, or people	11.68	4047
		PTSD3.3	Inability to recall aspects of the trauma	10.24	3549
		PTSD3.4	Diminished interest or participation in activities	13.96	4836
		PTSD3.5	Feelings of detachment or estrangement	12.6	4368
		PTSD3.6	Restricted range of affect	8.35	2893
		PTSD3.7	Sense of foreshortened future	4.98	1727
	Increased arousal	PTSD4.1	Difficulty falling or staying asleep	19.64	6806
		PTSD4.2	Irritability or outburst of anger	11.67	4043
		PTSD4.3	Difficulty concentrating	18.23	6318
		PTSD4.4	Hypervigilance	21.01	7280
		PTSD4.5	Exaggerated startle response	11.06	3834

Supplementary Table 2. Lasso penalized odds ratios of bootstrap edge weights in the BPD network.

	BPD1	BPD2	BPD3	BPD4	BPD5	BPD6	BPD7	BPD8	BPD9
BPD1		5.19	1.84	1.35	1.84	1.37	3.08	1.86	2.71
BPD2	5.19		2.02	2.49	1.89	1.41	1.85	2.06	3.30
BPD3	1.84	2.02		1.93	3.02	2.48	1.60	2.13	1.00
BPD4	1.35	2.49	1.93		2.64	2.28	1.44	1.93	1.26
BPD5	1.84	1.89	3.02	2.64		1.98	1.67	1.52	1.03
BPD6	1.37	1.41	2.48	2.28	1.98		2.75	1.66	1.84
BPD7	3.08	1.85	1.60	1.44	1.67	2.75		2.31	2.71
BPD8	1.86	2.06	2.13	1.93	1.52	1.66	2.31		1.56
BPD9	2.71	3.30	1.00	1.26	1.03	1.84	2.71	1.56	

BPD1 = 'Marked reactivity of mood', BPD2 = 'Chronic feelings of emptiness', BPD3 = 'Identity disturbance', BPD4 = 'Frantic efforts to avoid real or imagined abandonment', BPD5 = 'Extremes of idealization and devaluation', BPD6 = 'Impulsivity', BPD7 = 'Inappropriate anger', BPD8 = 'Transient paranoid ideation or severe dissociative symptoms', BPD9 = 'Self harm or suicidal gestures'

Supplementary Table 3. Lasso penalized odd ratios of bootstrap edge weights in the PTSD network

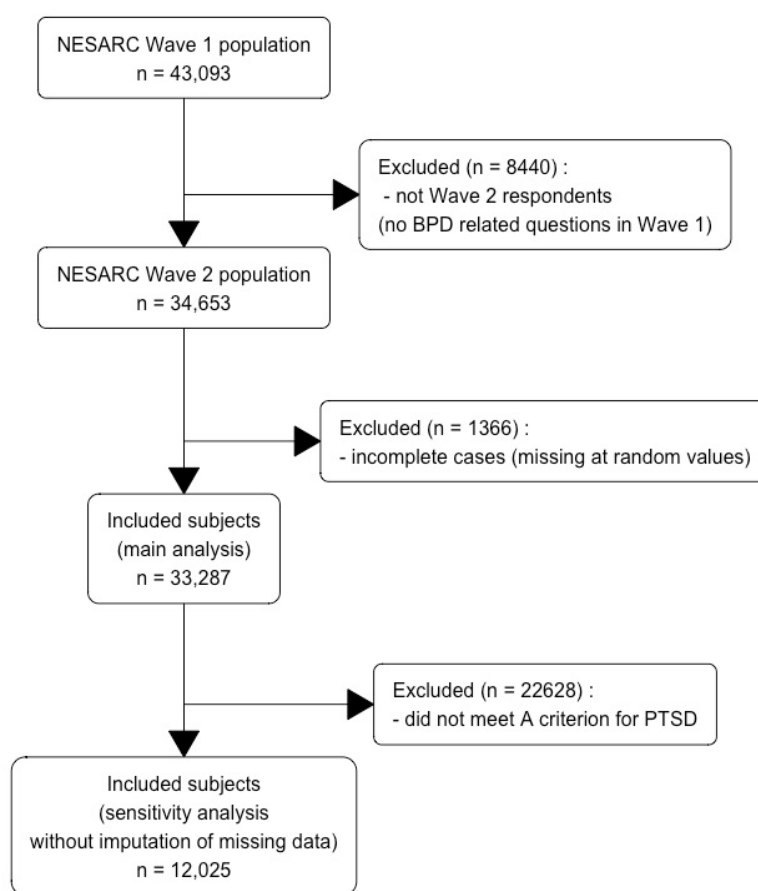
	PTSD 1.1	PTSD 1.2	PTSD 2.1	PTSD 2.2	PTSD 2.3	PTSD 2.4	PTSD 2.5	PTSD 3.1	PTSD 3.2	PTSD 3.3	PTSD 3.4	PTSD 3.5	PTSD 3.6	PTSD 3.7	PTSD 4.1	PTSD 4.2	PTSD 4.3	PTSD 4.4	PTSD 4.5
PTSD 1.1		1.99	2.42	1.21	1.35	1.13	1.15	1.42	0.98	1.35	1.38	1.00	0.90	1.41	1.42	1.00	1.52	1.12	1.14
PTSD 1.2	1.99		8.07	1.68	1.44	2.81	1.01	3.27	1.05	1.94	1.35	1.02	1.13	1.00	1.64	1.24	1.40	3.59	1.01
PTSD 2.1	2.42	8.07		3.11	3.29	3.00	1.26	2.72	1.06	0.99	1.65	1.07	1.00	0.99	1.67	1.01	1.58	1.52	0.98
PTSD 2.2	1.21	1.68	3.11		4.47	1.33	1.40	1.50	1.36	1.28	0.95	1.21	1.02	1.02	2.99	1.13	1.10	1.03	1.17
PTSD 2.3	1.35	1.44	3.29	4.47		2.05	2.10	1.44	1.21	1.42	1.16	1.02	1.14	1.30	1.23	1.00	1.03	1.33	1.95
PTSD 2.4	1.13	2.81	3.00	1.33	2.05		2.87	2.04	1.50	1.03	1.30	1.24	1.14	1.04	1.11	1.48	1.31	1.18	1.04
PTSD 2.5	1.15	1.01	1.26	1.40	2.10	2.87		1.74	1.39	1.16	1.09	1.09	1.20	1.03	1.45	1.10	1.42	1.25	1.67
PTSD 3.1	1.42	3.27	2.72	1.50	1.44	2.04	1.74		4.18	2.15	1.00	1.43	1.44	1.00	1.25	1.20	1.01	1.68	1.38
PTSD 3.2	0.98	1.05	1.06	1.36	1.21	1.50	1.39	4.18		1.54	2.43	1.93	1.41	1.36	1.08	1.09	1.00	1.26	1.33
PTSD 3.3	1.35	1.94	0.99	1.28	1.42	1.03	1.16	2.15	1.54		1.67	1.62	1.27	1.16	1.00	1.11	1.09	1.28	1.36
PTSD 3.4	1.38	1.35	1.65	0.95	1.16	1.30	1.09	1.00	2.43	1.67		4.24	1.62	1.66	1.83	1.23	2.39	1.00	1.02
PTSD 3.5	1.00	1.02	1.07	1.21	1.02	1.24	1.09	1.43	1.93	1.62	4.24		9.31	1.65	1.33	1.68	2.03	1.01	1.03
PTSD 3.6	0.90	1.13	1.00	1.02	1.14	1.14	1.20	1.44	1.41	1.27	1.62	9.31		4.70	1.03	2.01	1.21	1.25	1.17
PTSD 3.7	1.41	1.00	0.99	1.02	1.30	1.04	1.03	1.00	1.36	1.16	1.66	1.65	4.70		1.63	1.37	1.10	1.40	1.62
PTSD 4.1	1.42	1.64	1.67	2.99	1.23	1.11	1.45	1.25	1.08	1.00	1.83	1.33	1.03	1.63		1.82	5.33	1.23	1.55
PTSD 4.2	1.00	1.24	1.01	1.13	1.00	1.48	1.10	1.20	1.09	1.11	1.23	1.68	2.01	1.37	1.82		4.58	1.49	1.56
PTSD 4.3	1.52	1.40	1.58	1.10	1.03	1.31	1.42	1.01	1.00	1.09	2.39	2.03	1.21	1.10	5.33	4.58		1.18	1.39
PTSD 4.4	1.12	3.59	1.52	1.03	1.33	1.18	1.25	1.68	1.26	1.28	1.00	1.01	1.25	1.40	1.23	1.49	1.18		7.27
PTSD 4.5	1.14	1.01	0.98	1.17	1.95	1.04	1.67	1.38	1.33	1.36	1.02	1.03	1.17	1.62	1.55	1.56	1.39	7.27	

PTSD1.1 = 'Experienced, witnessed, or was confronted with traumatic event', PTSD1.2 = 'Response involved intense fear, helplessness, or horror', PTSD2.1 = 'Recurrent and intrusive distressing recollections of the event', PTSD2.2 = 'Recurrent distressing dreams of the event', PTSD2.3 = 'Acting or feeling as if the traumatic event were recurring', PTSD2.4 = 'Intense psychological distress at exposure to cues', PTSD2.5 = 'Physiological reactivity on exposure to cues', PTSD3.1 = 'Efforts to avoid thoughts, feelings, or conversations', PTSD3.2 = 'Efforts to avoid activities, places, or people', PTSD3.3 = 'Inability to recall important aspects of the trauma', PTSD3.4 = 'Diminished interest or participation in activities', PTSD3.5 = 'Feelings of detachment or estrangement', PTSD3.6 = 'Restricted range of affect', PTSD3.7 = 'Sense of foreshortened future', PTSD4.1 = 'Difficulty falling or staying asleep', PTSD4.2 = 'Irritability or outbursts of anger', PTSD4.3 = 'Difficulty concentrating', PTSD4.4 = 'Hypervigilance', PTSD4.5 = 'Exaggerated startle response'

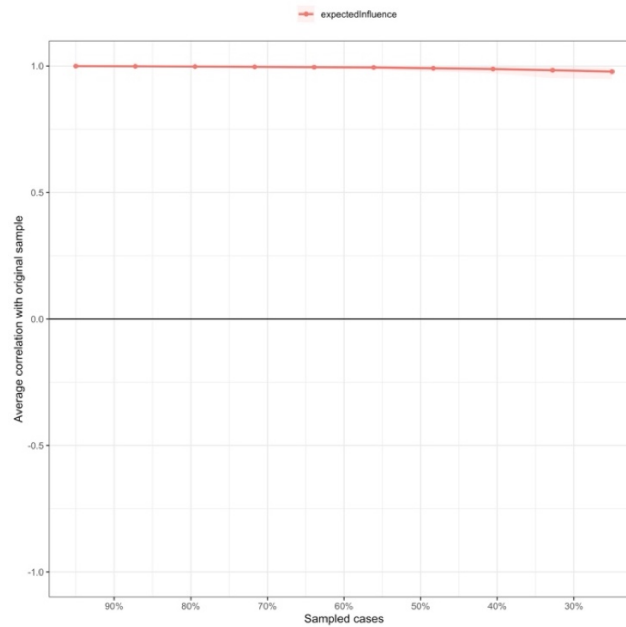
Supplementary Table 4. Lasso penalized odd ratios of bootstrap edge weights in the BPD/PTSD network

	BPD1	BPD2	BPD3	BPD4	BPD5	BPD6	BPD7	BPD8	BPD9
PTSD1.1	1.00	0.93	1.00	1.00	1.00	1.05	1.04	1.01	1.00
PTSD1.2	1.00	1.00	1.01	1.09	1.03	1.05	1.01	1.01	1.01
PTSD2.1	1.00	1.01	1.00	1.00	1.16	0.99	1.01	1.00	1.00
PTSD2.2	1.01	1.00	1.00	1.01	1.00	1.04	1.01	1.00	1.15
PTSD2.3	1.01	1.09	1.00	1.10	1.00	0.95	1.00	1.02	1.02
PTSD2.4	1.04	1.00	1.02	1.13	1.01	1.00	1.02	1.01	1.03
PTSD2.5	1.05	1.04	1.00	1.06	1.00	1.00	1.01	1.00	1.30
PTSD3.1	1.01	1.10	1.15	1.04	1.16	1.07	1.05	1.01	1.03
PTSD3.2	1.05	1.04	1.03	1.11	1.00	1.09	1.00	1.00	1.01
PTSD3.3	1.01	1.07	1.15	1.00	1.01	1.02	1.01	1.14	1.06
PTSD3.4	1.02	1.01	1.05	1.00	1.00	0.98	0.95	1.00	0.94
PTSD3.5	1.00	1.02	1.19	1.01	1.00	1.14	1.00	1.36	1.50
PTSD3.6	1.09	1.44	1.01	1.03	1.24	1.06	1.00	1.01	1.04
PTSD3.7	1.04	1.35	1.07	1.01	1.02	1.00	0.99	1.09	1.25
PTSD4.1	1.00	1.08	1.00	1.01	1.00	0.99	1.00	1.00	1.00
PTSD4.2	1.28	0.93	1.02	1.00	1.02	1.04	1.50	1.11	1.00
PTSD4.3	1.03	1.00	1.01	1.01	1.00	1.00	1.02	1.21	1.11
PTSD4.4	1.00	0.99	1.24	1.06	1.04	1.16	1.01	1.31	1.00
PTSD4.5	1.19	1.28	0.98	1.02	1.00	1.00	1.01	1.03	1.02

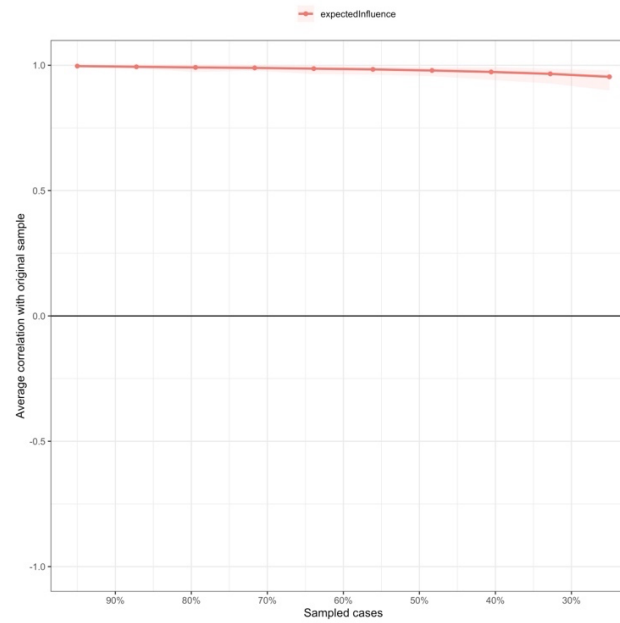
BPD1 = 'Marked reactivity of mood', BPD2 = 'Chronic feelings of emptiness', BPD3 = 'Identity disturbance', BPD4 = 'Frantic efforts to avoid real or imagined abandonment', BPD5 = 'Extremes of idealization and devaluation', BPD6 = 'Impulsivity', BPD7 = 'Inappropriate anger', BPD8 = 'Transient paranoid ideation or severe dissociative symptoms', BPD9 = 'Self harm or suicidal gestures', PTSD1.1 = 'Experienced, witnessed, or was confronted with traumatic event', PTSD1.2 = 'Response involved intense fear, helplessness, or horror', PTSD2.1 = 'Recurrent and intrusive distressing recollections of the event', PTSD2.2 = 'Recurrent distressing dreams of the event', PTSD2.3 = 'Acting or feeling as if the traumatic event were recurring', PTSD2.4 = 'Intense psychological distress at exposure to cues', PTSD2.5 = 'Physiological reactivity on exposure to cues', PTSD3.1 = 'Efforts to avoid thoughts, feelings, or conversations', PTSD3.2 = 'Efforts to avoid activities, places, or people', PTSD3.3 = 'Inability to recall important aspects of the trauma', PTSD3.4 = 'Diminished interest or participation in activities', PTSD3.5 = 'Feelings of detachment or estrangement', PTSD3.6 = 'Restricted range of affect', PTSD3.7 = 'Sense of foreshortened future', PTSD4.1 = 'Difficulty falling or staying asleep', PTSD4.2 = 'Irritability or outbursts of anger', PTSD4.3 = 'Difficulty concentrating', PTSD4.4 = 'Hypervigilance', PTSD4.5 = 'Exaggerated startle response'

Supplementary Figure 1. Flowchart of study sample selection

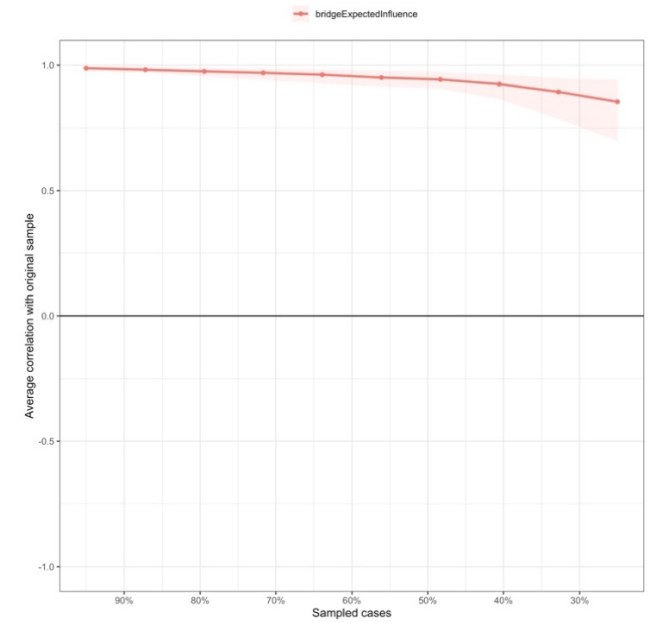
Supplementary Figure 2. Results of case-drop bootstrap (n=1000) for the BPD network



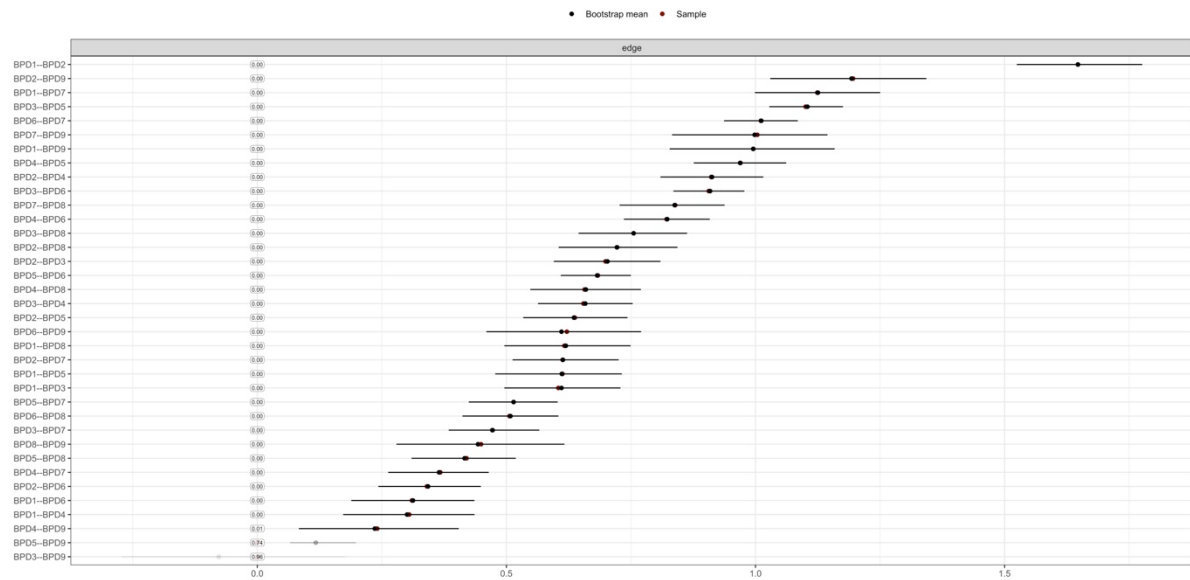
Supplementary Figure 3. Results of case-drop bootstrap (n=1000) for the PTSD network



Supplementary Figure 4. Results of case-drop bootstrap (n=1000) for the BPD/PTSD network

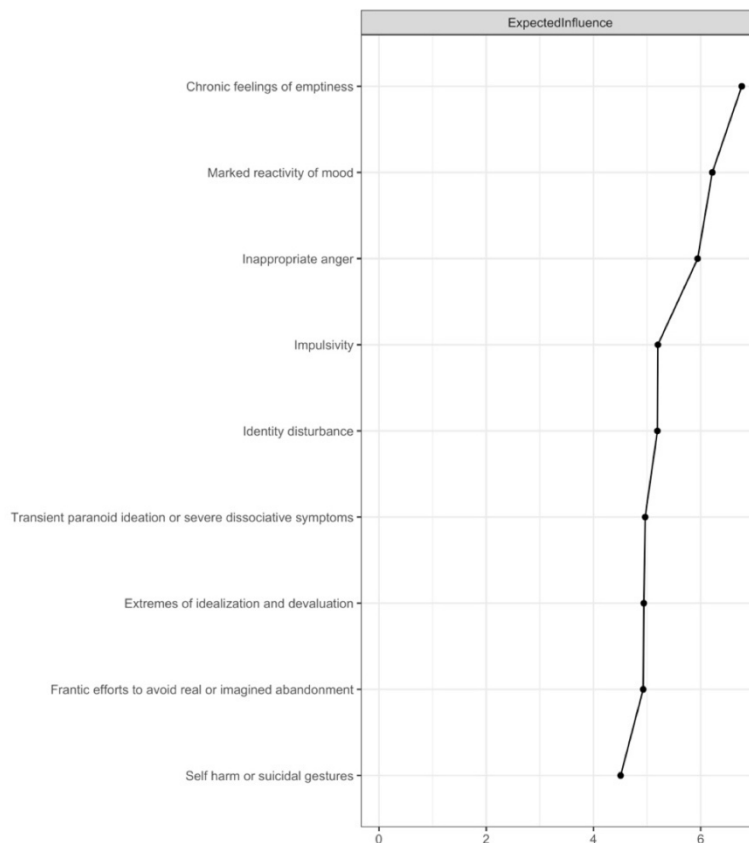


Supplementary Figure 5. Results of non-parametric bootstrap (n=1000) for the BPD network (edge weights)

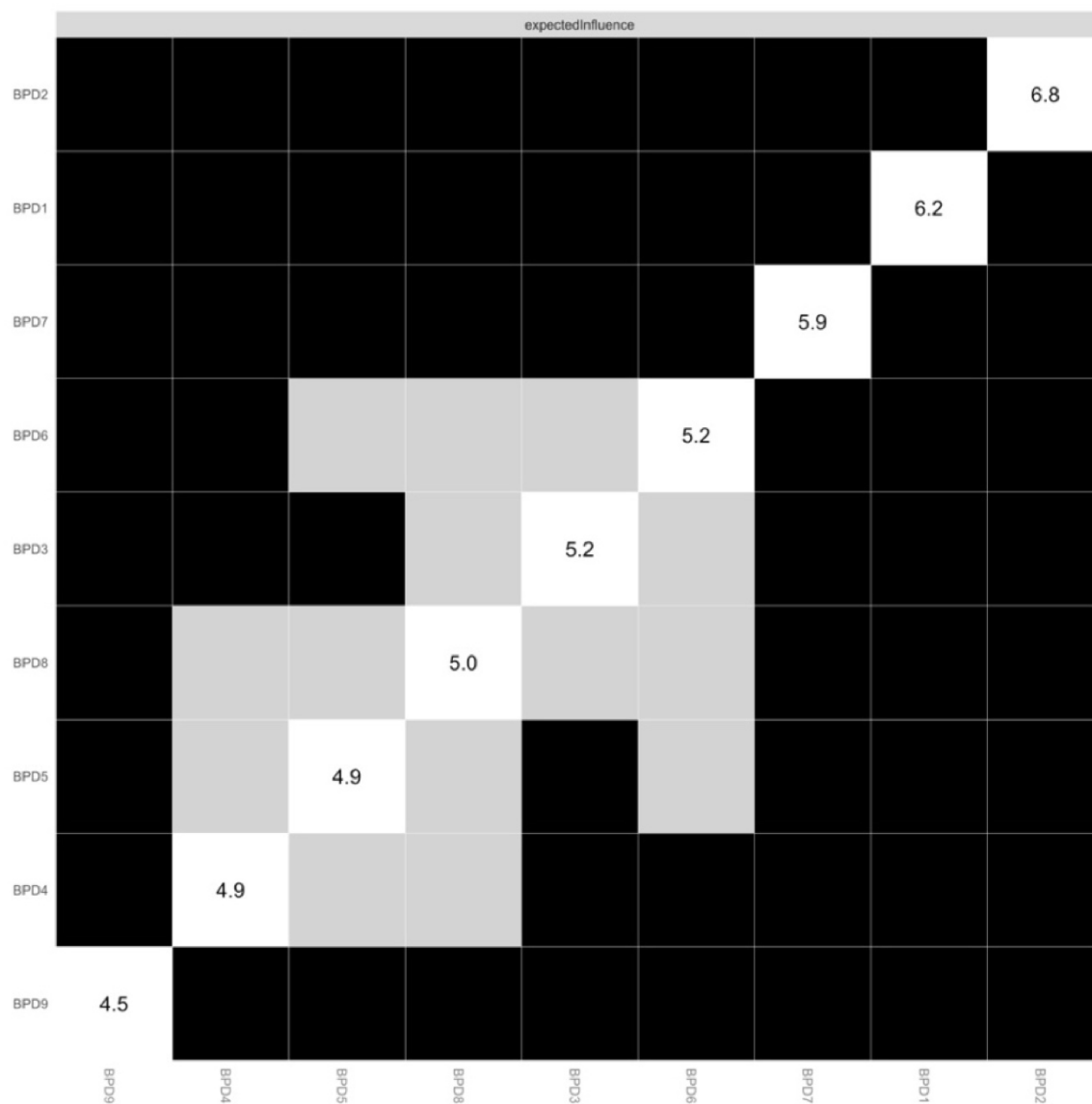


BPD1 = 'Marked reactivity of mood', BPD2 = 'Chronic feelings of emptiness', BPD3 = 'Identity disturbance', BPD4 = 'Frantic efforts to avoid real or imagined abandonment', BPD5 = 'Extremes of idealization and devaluation', BPD6 = 'Impulsivity', BPD7 = 'Inappropriate anger', BPD8 = 'Transient paranoid ideation or severe dissociative symptoms', BPD9 = 'Self harm or suicidal gestures'

Supplementary Figure 6. Expected influence of BPD symptoms in the estimated BPD network

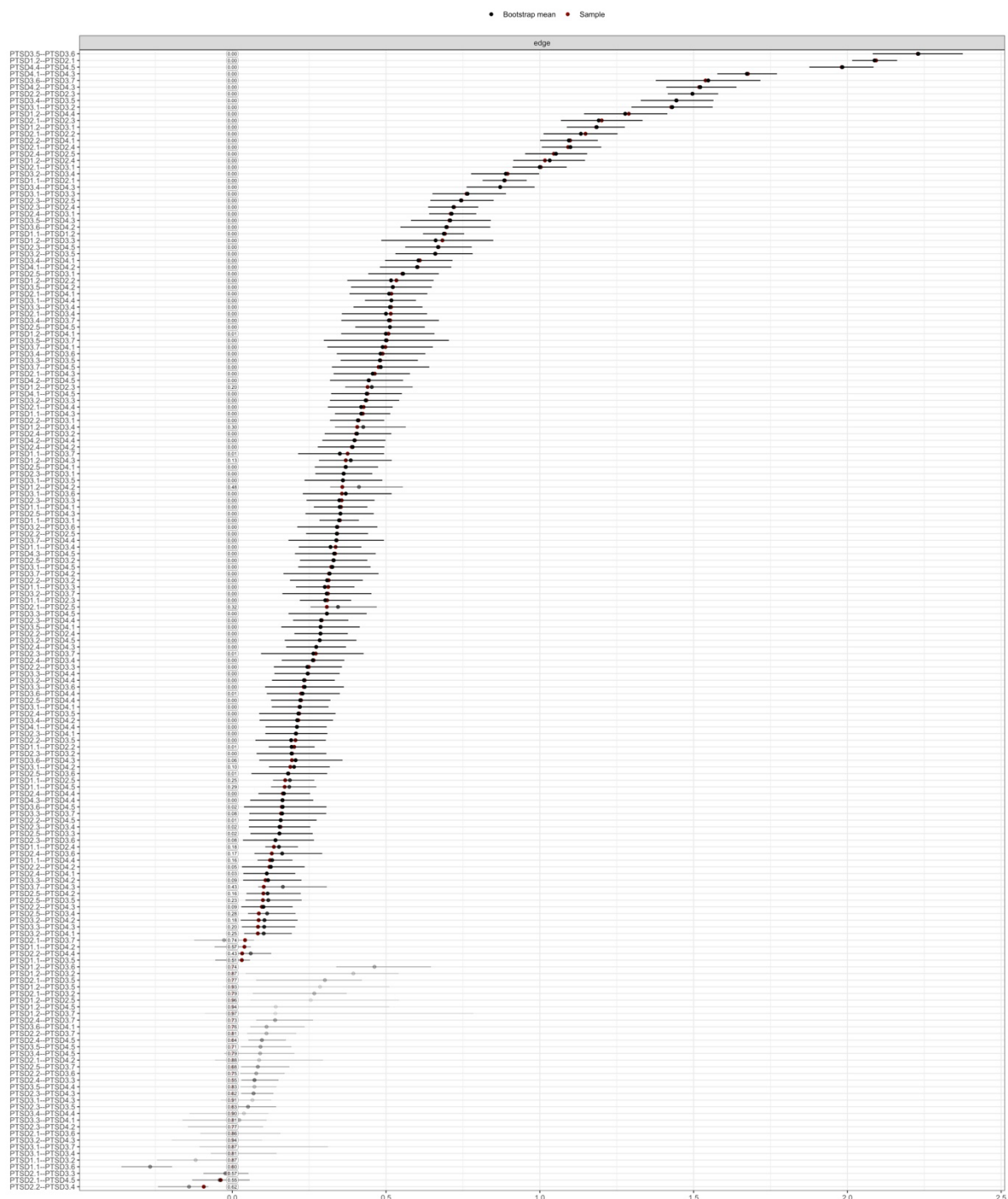


Supplementary Figure 7. Results of non-parametric bootstrap (n=1000) for the BPD network (expected influence)



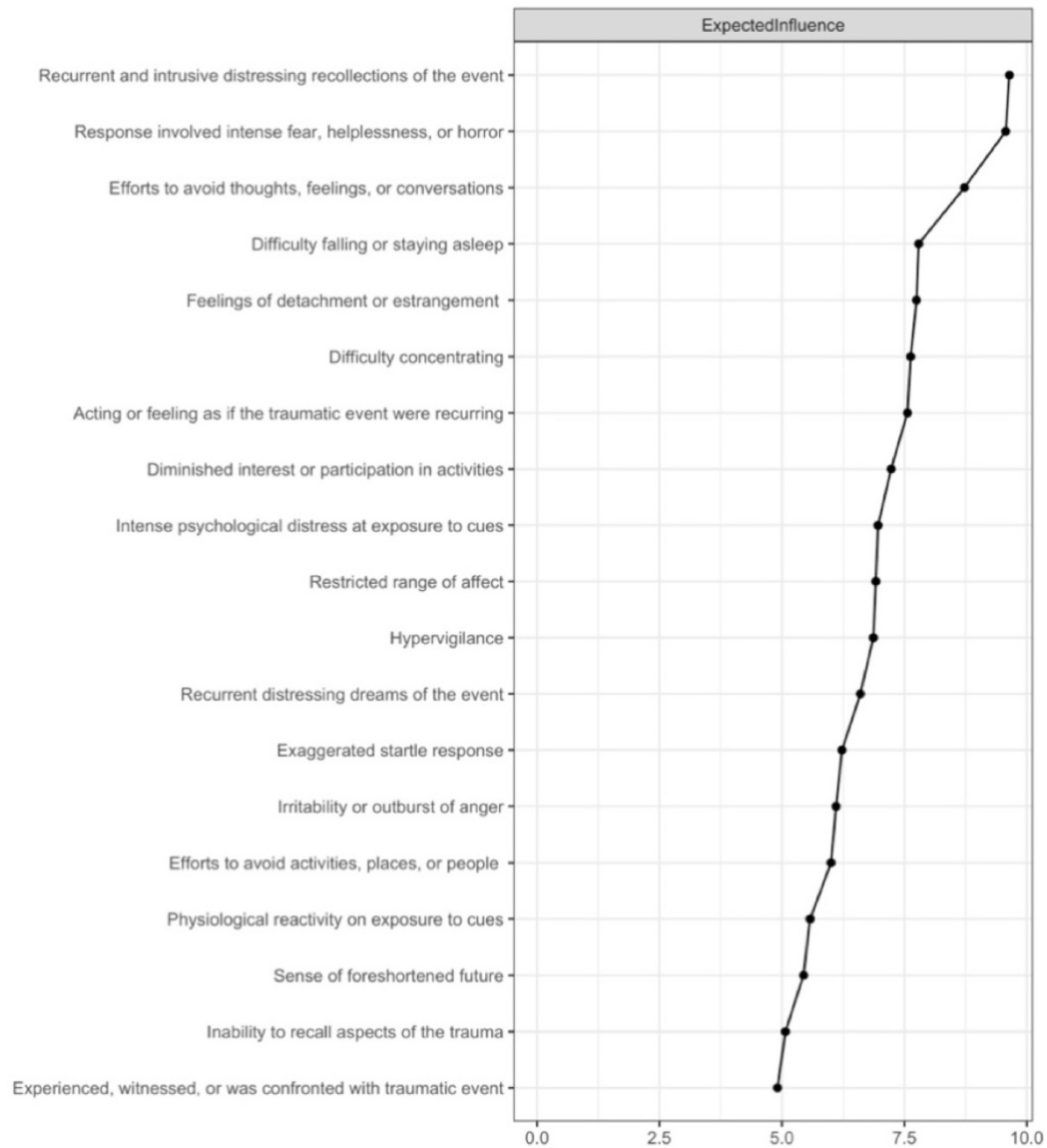
Black squares represent significant between-node differences for the centrality measure. Grey squares represent non-significant between-node differences for the centrality measure. Significance level of non-parametric bootstrap conducted was $p < 0.05$.

Supplementary Figure 8. Results of non-parametric bootstrap (n=1000) for the PTSD network (edge weights)

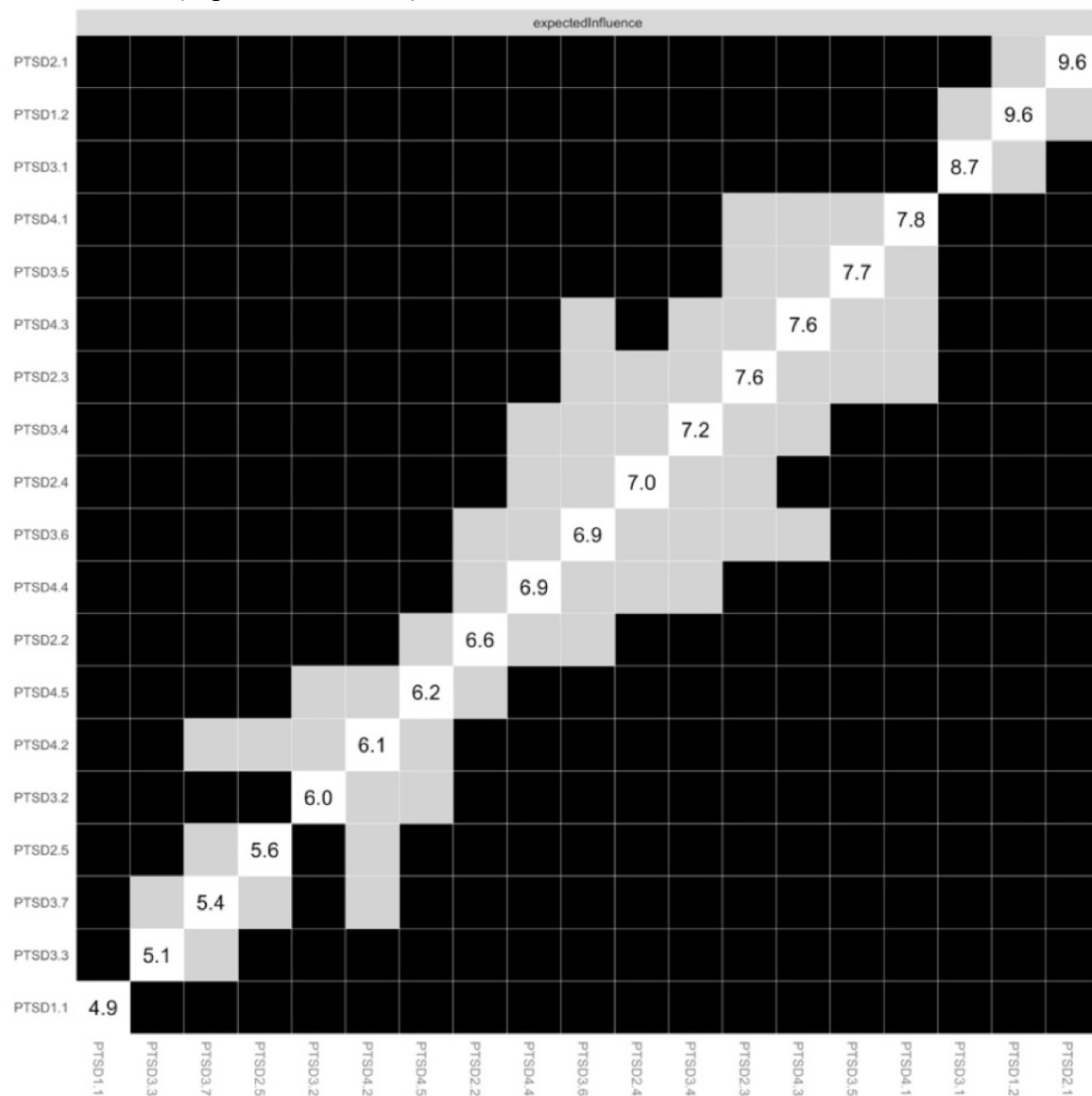


PTSD1.1 = 'Experienced, witnessed, or was confronted with traumatic event', PTSD1.2 = 'Response involved intense fear, helplessness, or horror', PTSD2.1 = 'Recurrent and intrusive distressing recollections of the event', PTSD2.2 = 'Recurrent distressing dreams of the event', PTSD2.3 = 'Acting or feeling as if the traumatic event were recurring', PTSD2.4 = 'Intense psychological distress at exposure to cues', PTSD2.5 = 'Physiological reactivity on exposure to cues', PTSD3.1 = 'Efforts to avoid thoughts, feelings, or conversations', PTSD3.2 = 'Efforts to avoid activities, places, or people', PTSD3.3 = 'Inability to recall important aspects of the trauma', PTSD3.4 = 'Diminished interest or participation in activities', PTSD3.5 = 'Feelings of detachment or estrangement', PTSD3.6 = 'Restricted range of affect', PTSD3.7 = 'Sense of foreshortened future', PTSD4.1 = 'Difficulty falling or staying asleep', PTSD4.2 = 'Irritability or outbursts of anger', PTSD4.3 = 'Difficulty concentrating', PTSD4.4 = 'Hypervigilance', PTSD4.5 = 'Exaggerated startle response'

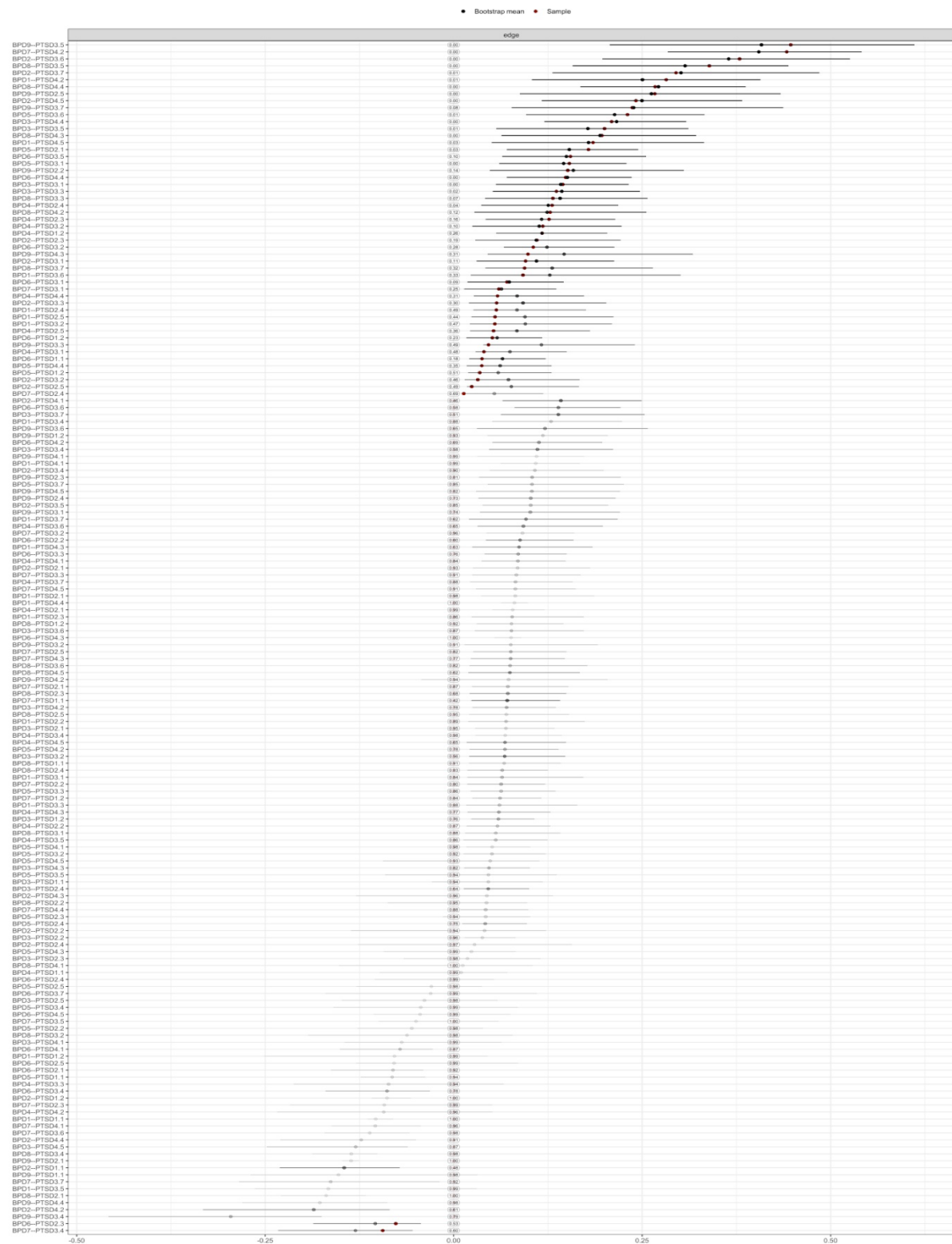
Supplementary Figure 9. Expected influence of PTSD symptoms in the estimated PTSD network



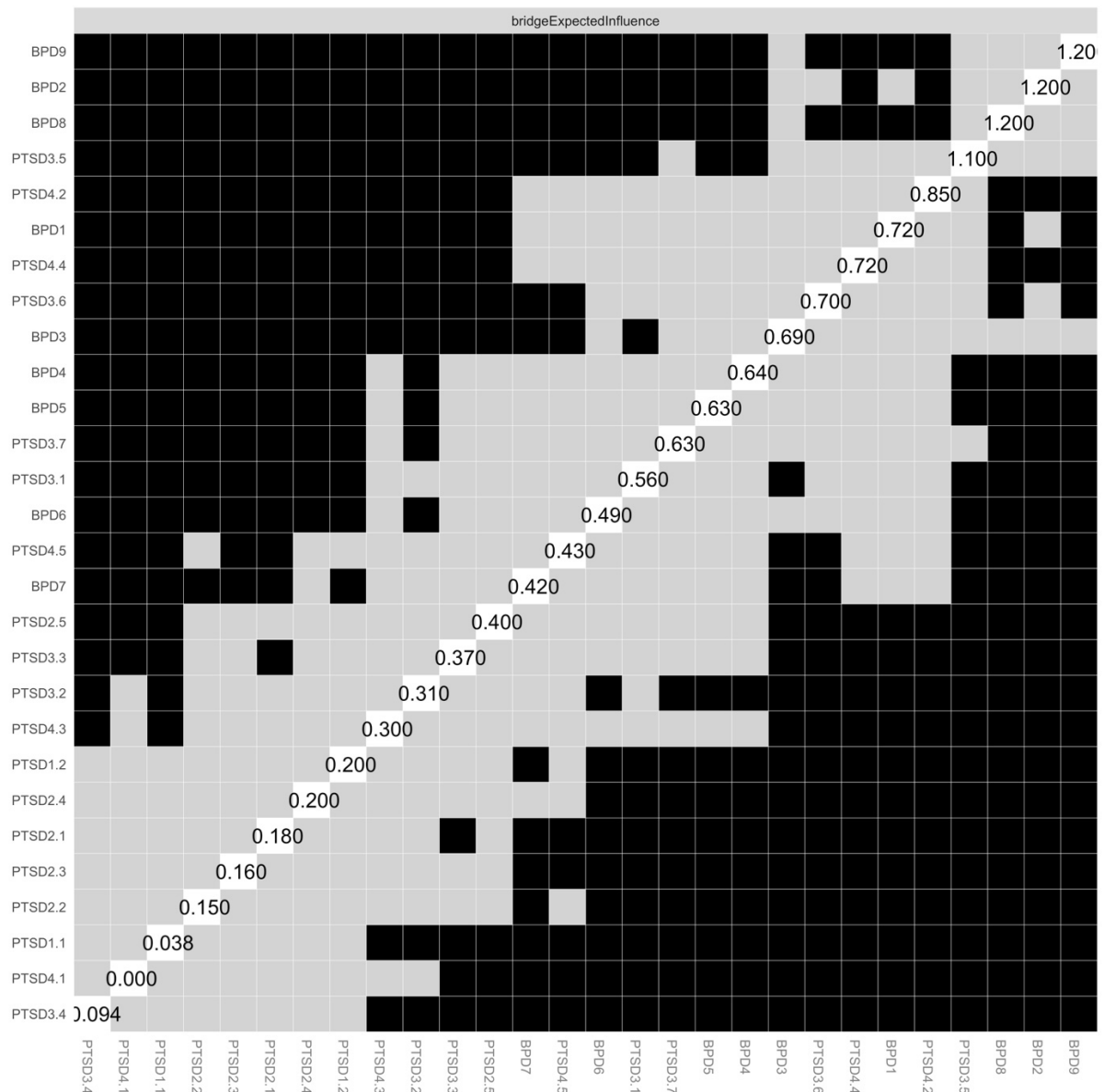
Supplementary Figure 10. Results of non-parametric bootstrap (n=1000) for the PTSD network (expected influence)



Black squares represent significant between-node differences for the centrality measure. Grey squares represent non-significant between-node differences for the centrality measure. Significance level of non-parametric bootstrap conducted was $p < 0.05$.



Supplementary Figure 12. Results of non-parametric bootstrap (n=1000) for the BPD/PTSD network (bridge expected influence)



Black squares represent significant between-node differences for the centrality measure. Grey squares represent non-significant between-node differences for the centrality measure. Significance level of non-parametric bootstrap conducted was $p < 0.05$. BPD1 = 'Marked reactivity of mood', BPD2 = 'Chronic feelings of emptiness', BPD3 = 'Identity disturbance', BPD4 = 'Frantic efforts to avoid real or imagined abandonment', BPD5 = 'Extremes of idealization and devaluation', BPD6 = 'Impulsivity', BPD7 = 'Inappropriate anger', BPD8 = 'Transient paranoid ideation or severe dissociative symptoms', BPD9 = 'Self harm or suicidal gestures', PTSD1.1 = 'Experienced, witnessed, or was confronted with traumatic event', PTSD1.2 = 'Response involved intense fear, helplessness, or horror', PTSD2.1 = 'Recurrent and intrusive distressing recollections of the event', PTSD2.2 = 'Recurrent distressing dreams of the event', PTSD2.3 = 'Acting or feeling as if the traumatic event were recurring', PTSD2.4 = 'Intense psychological distress at exposure to cues', PTSD2.5 = 'Physiological reactivity on exposure to cues', PTSD3.1 = 'Efforts to avoid thoughts, feelings, or conversations', PTSD3.2 = 'Efforts to avoid activities, places, or people', PTSD3.3 = 'Inability to recall important aspects of the trauma', PTSD3.4 = 'Diminished interest or participation in activities', PTSD3.5 = 'Feelings of detachment or estrangement', PTSD3.6 = 'Restricted range of affect', PTSD3.7 = 'Sense of foreshortened future', PTSD4.1 = 'Difficulty falling or staying asleep', PTSD4.2 = 'Irritability or outbursts of anger', PTSD4.3 = 'Difficulty concentrating', PTSD4.4 = 'Hypervigilance', PTSD4.5 = 'Exaggerated startle response'

Supplementary Figure 13. Sensitivity analysis of Bridge Expected Influence (1-step) of nodes in the BPD/PTSD network



Sensitivity analysis was conducted by including participants with complete observations (i.e., participants who met the primary criterion for PTSD, without imputation of the skip-structure). The highest scoring symptoms are comparable to those obtained in the main analysis, with symptom « restricted range of affect » scoring higher in the sensitivity analysis.