

Scoglio, A.A.J., et al.: **Sexual trauma and compulsive sexual behavior in young men and women: A network analysis involving two samples**

<https://doi.org/10.1556/2006.2024.00073>

Supplemental Materials

Description of Study Measures

Sexual and Physical Abuse History Questionnaire (Leserman et al., 1995): This measure assesses an individual's sexual abuse experiences. It consists of items that assess different types of sexual trauma: "Has anyone ever exposed the sex organs of their body to you when you did not want it?" "Has anyone ever threatened to have sex with you when you did not want it?" "Has anyone ever touched the sex organs of your body when you did not want this?" "Has anyone ever made you touch the sex organs of their body when you did not want this?" "Has anyone ever forced you to have sex when you did not want this?" "Have you had any other unwanted sexual experiences not mentioned above?." .

Compulsive Sexual Behavior Inventory-13 (CSBI-13; Miner et al., 2017). Example items include: "How often have you had trouble controlling your sexual urges?" "How often have you used sex to deal with worries or problems in your life?" "How often have you felt guilty or shameful about aspects of your sexual behavior?" CSBI-13 has been well validated in various community samples and has demonstrated good internal consistency, content validity, and criterion-related validity (Coleman et al., 2019).

Compulsive Sexual Behavior Disorder Scale (CSBD-19; Bothe et al., 2020). The five factors of the CSBD-19 include control (failure to control CSB), salience (CSB being the central focus of a person's life), relapse (unsuccessful efforts to reduce CSB), dissatisfaction (experiencing less satisfaction from sexual behaviors), and negative consequences (CSB causing clinically significant distress). Example items include: "My sexual desires controlled me." (control), "Sex has been the most important thing in my life." (salience), "I was not

successful in reducing the amount of sex I had” (relapse), “I had sex even when I did not enjoy it anymore” (dissatisfaction), and “My sexual activities interfered with my work and/or education,” (negative consequences). CSBD-19 has good internal consistency, content validity, and criterion-related validity (Bothe et al., 2020) and has demonstrated robust psychometric properties in a 42 country, 26 language study of 82,243 adults (Bothe et al., 2023).

DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure—Adult (American Psychiatric Association, 2013a): This measure assesses the central symptoms of various psychiatric diagnoses based on the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5). Participants rated symptom severity in the past two weeks using a 5-point scale (0 = not at all to 4 = nearly every day) in sample 1, and a 4-point scale (0 = not at all to 3 = nearly every day) in sample 2. In the current study, we calculated the psychological distress score by summing 2 depression items (i.e., “little interest or pleasure in doing things” and “feeling down, depressed, or hopeless”) and 3 anxiety items (i.e., “feeling nervous, anxious, frightened, worried, or on edge,” “feeling panic or being frightened,” and “avoiding situations that make you anxious”), similar to Doss & Lowmaster (2022) who summed all items to create an index of symptom severity.

DSM-5 Level 2—Substance Use—Adult (American Psychiatric Association, 2013b): This questionnaire is a modified version of the National Institute on Drug Abuse-Modified Alcohol, Smoking, and Substance Involvement Screening Test (NIDA-ASSIST) that measures alcohol use, prescription medication and illicit substance use in individuals aged 18 or older. This questionnaire covers 10 types of substances (i.e., “alcohol,” “cigarettes, a cigar, or pipe, or using snuff or chewing tobacco,” “marijuana,” “vapes or e-cigarettes,” “cocaine (powder or crack),” “heroin (snorted/injected),” “club drugs (ecstasy/MDMA),” “painkillers (e.g., oxyContin, vicodin, codeine),” “methamphetamine (speed, crystal),” and “sedatives or

tranquilizers (e.g., valium, librium, xanax, sleeping pills)”) and an option for other substances. Response options include “None at all,” “Rare, less than a day or two days,” “Several days a week,” “More than half the days of the week,” and “Nearly every day.” In sample 1, all 11 items were included. In sample 2, only 4 items (alcohol, marijuana, vapes or e-cigarettes, and painkillers) were included. In the current study, we recoded the items into 0 (“None at all”) and 1 (all other options) and calculated the substance use score by summing all items.

De-identified data and analytic R syntax are available via the Open Science Framework (https://osf.io/sjm6n/?view_only=66bb7623b7cd40faafbb5e8fea4c9c74).

Supplemental Table 1

Descriptive Statistics of Demographic and Study Variables By Gender

	Sample 1			Sample 2		
	Man	Woman	Gender difference	Man	Woman	Gender difference
	<i>M (SD) or n (%)</i>	<i>M (SD) or n (%)</i>		<i>M (SD) or n (%)</i>	<i>M (SD) or n (%)</i>	
Age	20.39 (4.35)	19.73 (3.78)	$d = 0.17^{**}$	20.11 (3.81)	19.47 (3.25)	$d = 0.19^{***}$
Race			$\phi = 0.11^{***}$			$\phi = 0.08^{**}$
White	207 (36.4%)	474 (37.1%)		287 (43.8%)	825 (50.7%)	
Black	49 (8.6%)	151 (11.8%)		59 (9.0%)	138 (8.5%)	
Asian	157 (27.6%)	239 (18.7%)		108 (16.5%)	187 (11.5%)	
Multiracial or other races	155 (27.2%)	405 (31.7%)		199 (30.4%)	471 (28.9%)	
Prefer not to say	1 (0.2%)	8 (0.6%)		2 (0.3%)	7 (0.4%)	
Ethnicity			$\phi = 0.06^*$			$\phi = 0.03$
Hispanic/Latinx	138 (24.3%)	381 (29.8%)		184 (28.1%)	504 (31.0%)	
Not Hispanic/Latinx	430 (75.6%)	888 (69.5%)		469 (71.6%)	1,117 (68.6%)	
Prefer not to say	1 (0.2%)	8 (0.6%)		2 (0.3%)	7 (0.4%)	
Any trauma history	148 (26.0%)	689 (54.0%)	$\phi = 0.26^{***}$	157 (24.0%)	774 (47.5%)	$\phi = 0.22^{***}$
Childhood trauma only	22 (3.9%)	78 (6.1%)	$\phi = 0.05$	29 (4.4%)	106 (6.5%)	$\phi = 0.04$
Adolescent/Adult trauma only	96 (16.9%)	358 (28.0%)	$\phi = 0.12^{***}$	85 (13.0%)	318 (19.5%)	$\phi = 0.08^{***}$
Revictimized	30 (5.3%)	253 (19.8%)	$\phi = 0.19^{***}$	43 (6.6%)	350 (21.5%)	$\phi = 0.18^{***}$
CSBI-13	24.51 (8.62)	22.04 (7.97)	$d = 0.30^{***}$			
CSBI-13 (≥ 35)	74 (13.0%)	113 (8.8%)	$\phi = 0.06^{**}$			
CSBD-19						
Control				4.93 (2.19)	4.22 (1.72)	$d = 0.38^{***}$
Salience				4.49 (1.87)	3.91 (1.54)	$d = 0.35^{***}$
Relapse				4.88 (1.99)	4.35 (1.79)	$d = 0.29^{***}$
Dissatisfaction				4.75 (2.32)	5.17 (2.70)	$d = 0.16^{***}$
Negative consequences				10.75 (4.57)	9.74 (3.95)	$d = 0.24^{***}$
CSBD-19 (≥ 35)				43 (6.6%)	50 (3.1%)	$\phi = 0.08^{***}$
Psychological distress ^a	5.23 (4.35)	6.89 (4.99)	$d = -0.35^{***}$	3.79 (3.52)	5.30 (3.88)	$d = -0.40^{***}$

Substance use ^b	1.28 (1.55)	1.27 (1.38)	$d = 0.004$	1.23 (1.13)	1.41 (1.10)	$d = -0.17***$
Transactional sex	21 (3.7%)	21 (1.6%)	$\phi = 0.06^*$	27 (4.1%)	52 (3.2%)	$\phi = 0.02$
Sample size	569	1,277		655	1,628	

Note. The “prefer not to say” category was excluded from the calculation of effect size. Chi-square tests and Welch’s t tests were used to test gender differences. CSBI-13 = Compulsive Sexual Behavior Inventory, CSBD-19 = Compulsive Sexual Behavior Disorder Scale.

^a Sample 1 used a five-point scale (0 = *not at all*, 4 = *nearly every day*) while Sample 2 used a four-point scale (0 = *not at all*, 3 = *nearly every day*).

^b Sample 1 included 11 substances while Sample 2 only included four substances (i.e., alcohol, marijuana, vape or e-cigarettes, and painkillers).

* $p < .05$, ** $p < .01$, *** $p < .001$

Supplemental Table 2

Frequency of Different Types of Sexual Trauma in Sample 1 and 2

	Sample 1 (<i>n</i> = 1,888)		Sample 2 (<i>n</i> = 2,337)		Sample difference	
	As a child (13 years or younger)	As an adult (14 and over)	As a child (13 years or younger)	As an adult (14 and over)	As a child (13 years or younger)	As an adult (14 and over)
• Has anyone ever exposed the sex organs of their body to you when you did not want it?	278 (14.7%)	543 (28.8%)	397 (17.0%)	634 (27.1%)	$\phi = 0.03^*$	$\phi = 0.02$
• Has anyone ever touched the sex organs of your body when you did not want this?	265 (14.0%)	496 (26.3%)	351 (15.0%)	545 (23.3%)	$\phi = 0.01$	$\phi = 0.03^*$
• Has anyone ever made you touch the sex organs of their body when you did not want this?	166 (8.8%)	333 (17.6%)	231 (9.9%)	373 (16.0%)	$\phi = 0.02$	$\phi = 0.02$
• Has anyone ever threatened to have sex with you when you did not want it?	85 (4.5%)	245 (13.0%)	137 (5.9%)	278 (11.9%)	$\phi = 0.03^*$	$\phi = 0.02$
• Has anyone ever forced you to have sex when you did not want this?	61 (3.2%)	234 (12.4%)	86 (3.7%)	253 (10.8%)	$\phi = 0.01$	$\phi = 0.02$
• Have you had any other unwanted sexual experiences not mentioned above?	84 (4.4%)	180 (9.5%)	100 (4.3%)	176 (7.5%)	$\phi = 0.00$	$\phi = 0.04^*$

Note. Chi-square tests were used to test sample differences.

* $p < .05$, ** $p < .01$, *** $p < .001$

Supplemental Table 3

Bridge Centrality of Five Compulsive Sexual Behavior Domains in Sample 2

Node	Bridge strength	Bridge expected influence
Control	0.00 ^a	0.00 ^a
Salience	0.04 ^a	0.04 ^a
Relapse	0.09 ^a	0.09 ^a
Dissatisfaction	0.38 ^b	0.38 ^b
Negative consequences	0.41 ^b	0.41 ^b

Note. Bridge strength and expected influence are indicators of bridge centrality. A higher value in bridge centrality indicates that the node is more important in connecting CSB nodes to non-CSB nodes. Different superscripts denote significant mean differences.

Supplemental Table 4

Results for Network Comparison Tests Between Man and Woman Networks

Node 1	Node 2	Test statistic E	p value
Sample 1			
TRAU	CSB	0.19*	.030
TRAU	TS	0.57*	.035
CSB	TS	0.10	.851
TRAU	PD	0.04	.617
CSB	PD	0.12*	.020
TS	PD	0.53*	.015
TRAU	SU	0.20	.085
CSB	SU	0.10	.055
TS	SU	0.27	.413
PD	SU	0.04	.542
Sample 2			
TRAU	CON		
TRAU	SAL		
CON	SAL	0.11*	.032
TRAU	REL		
CON	REL	0.00	.920
SAL	REL	0.05	.289
TRAU	DIS	0.04	.606
CON	DIS		
SAL	DIS	0.10	.052
REL	DIS	0.11*	.025
TRAU	NEG	0.01	.928
CON	NEG	0.07	.130
SAL	NEG	0.03	.576
REL	NEG	0.03	.606
DIS	NEG	0.12*	.017
TRAU	TS	0.44	.125
CON	TS		
SAL	TS		
REL	TS		
DIS	TS		
NEG	TS	0.29	.082
TRAU	PD	0.01	.900
CON	PD		
SAL	PD		
REL	PD		
DIS	PD	0.03	.738
NEG	PD	0.07	.618
TS	PD		
TRAU	SU	0.10	.404
CON	SU		
SAL	SU		
REL	SU		
DIS	SU	0.04	.409
NEG	SU		
TS	SU	0.17	.728
PD	SU	0.07	.105

Note. See Figure 1 for full variable names of nodes. Statistics for group differences were reported for edges that were selected in one or both networks. Blank cells indicate those edges not tested for group differences.

* $p < .05$, ** $p < .01$, *** $p < .001$

Supplemental Table 5*Comparison of Node Centrality Between Men and Women Networks (Sample 1)*

	Strength	Expected influence
	<i>p</i> value	<i>p</i> value
TRUA	.557	.557
CSB	.891	.891
TS	.025	.502
PD	.015	.035
SU	.975	.975

Note. Non-parametric bootstrapping with 1,000 resamples was used. CS coefficients indicated that the men and women networks were not stable in Sample 1; results should be interpreted with caution.

Supplemental Table 6*Comparison of Node Centrality Between Men and Women Networks (Sample 2)*

	Strength	Expected influence
	<i>p</i> value	<i>p</i> value
TRUA	.423	.313
CON	.617	.617
SAL	.811	.811
REL	.478	.244
DIS	.920	.920
NEG	.776	.776
TS	.169	.164
PD	.498	.498
SU	.667	.667

Note. Non-parametric bootstrapping with 1,000 resamples was used.

Supplemental Table 7

Results for Network Comparison Tests Between Childhood Sexual Trauma and Sexual

Revictimization Networks

Node 1	Node 2	Test statistic E	p value
Sample 1			
CST/REV	CSB	0.18*	.040
CST/REV	TS		
CSB	TS	0.21	.393
CST/REV	PD	0.00	.995
CSB	PD	0.11	.194
TS	PD	0.03	.522
CST/REV	SU		
CSB	SU	0.20	.114
TS	SU	0.01	.821
PD	SU	0.13	.617
Sample 2			
CST/REV	CON		
CST/REV	SAL		
CON	SAL	0.04	.319
CST/REV	REL		
CON	REL	0.01	.757
SAL	REL		
CST/REV	DIS	0.22*	.010
CON	DIS		
SAL	DIS	0.08*	.040
REL	DIS	0.00	.983
CST/REV	NEG	0.08	.123
CON	NEG	0.04	.289
SAL	NEG	0.03	.405
REL	NEG	0.02	.568
DIS	NEG	0.03	.355
CST/REV	TS	0.49	.329
CON	TS		
SAL	TS		
REL	TS		
DIS	TS		
NEG	TS	0.25	.346
CST/REV	PD	0.16*	.047
CON	PD		
SAL	PD		
REL	PD		
DIS	PD	0.03	.312
NEG	PD	0.01	.787
TS	PD		
CST/REV	SU	0.11	.239
CON	SU		
SAL	SU		
REL	SU		
DIS	SU	0.02	.611
NEG	SU		
TS	SU	0.25	.349
PD	SU	0.02	.588

Note. See Figure 1 for full variable names of nodes. Statistics for group differences were reported for edges that were selected in one or both networks. Blank cells indicate those edges not tested for group differences.

* $p < .05$, ** $p < .01$, *** $p < .001$

Supplemental Table 8

Comparison of Node Centrality Between Child Sexual Trauma and Revictimization Networks (Sample 1)

	Strength	Expected influence
	<i>p</i> value	<i>p</i> value
CST/REV	.025	.025
CSB	.920	.920
TS	.572	.572
PD	.483	.483
SU	.279	.279

Note. Non-parametric bootstrapping with 1,000 resamples was used. CS coefficients indicated that the CST network was not stable in Sample 1; results of the network comparison should be interpreted with caution.

Supplemental Table 9

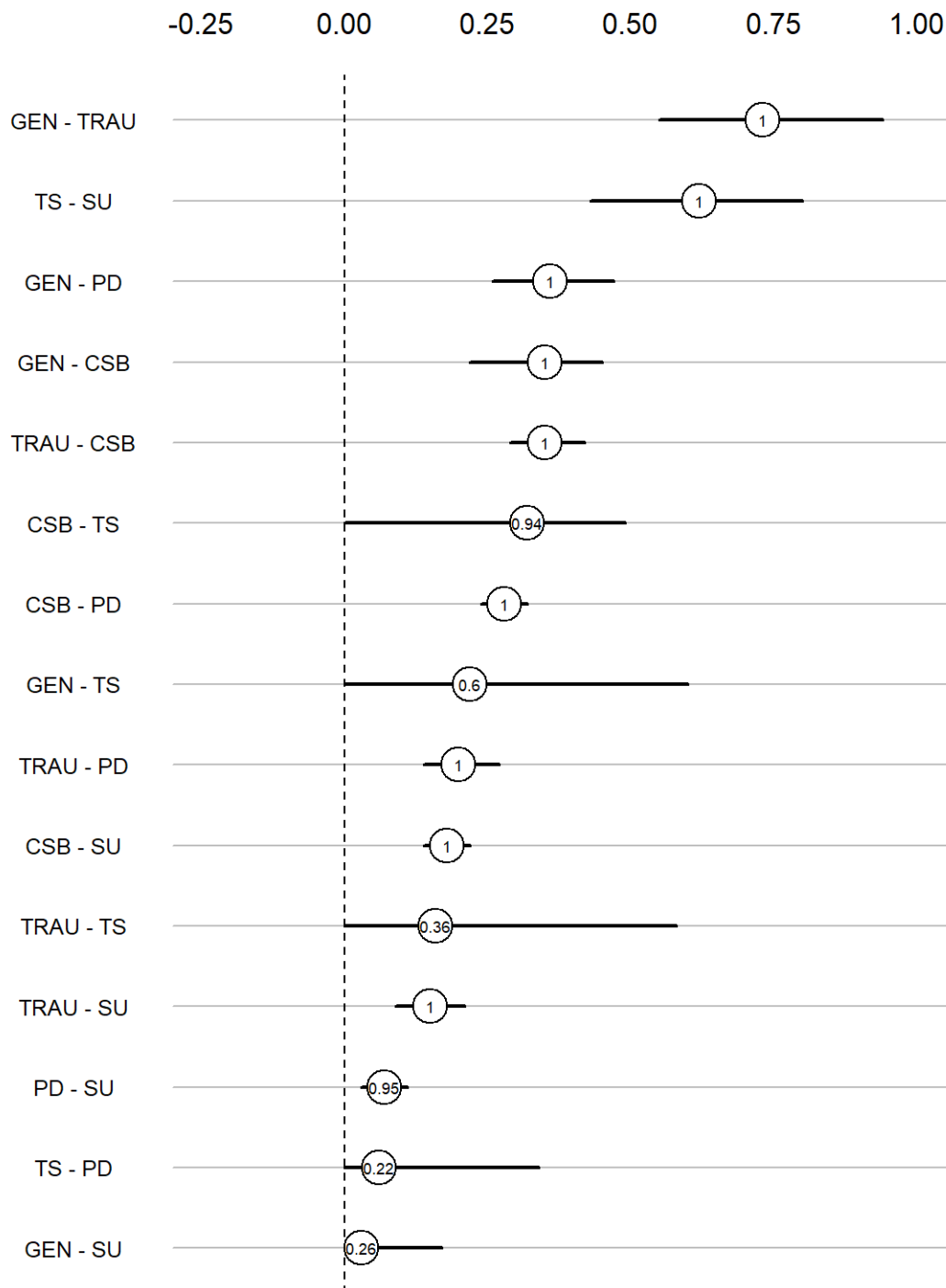
Comparison of Node Centrality Between Child Sexual Trauma and Revictimization Networks (Sample 2)

	Strength	Expected influence
	<i>p</i> value	<i>p</i> value
CST/REV	.005	.005
CON	.876	.876
SAL	.498	.498
REL	.856	.856
DIS	.045	.045
NEG	.209	.209
TS	.164	.164
PD	.219	.219
SU	.259	.259

Note. Non-parametric bootstrapping with 1,000 resamples was used.

Supplemental Figure 1

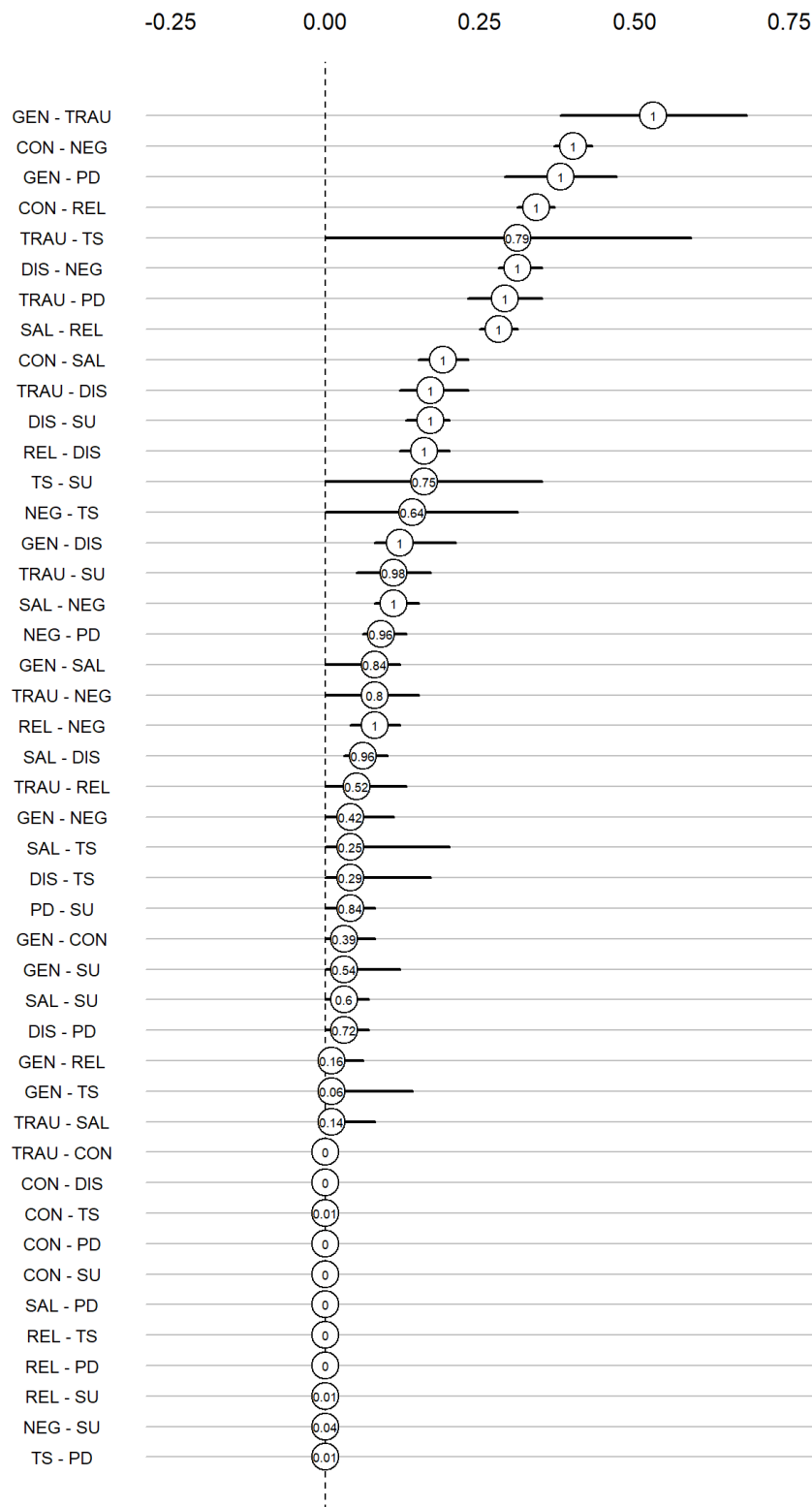
Stability Analysis: Edge-Weight Accuracy (Sample 1, Entire Sample)



Note. The black lines denote 5% and 95% quantiles of bootstrapped statistics with 1,000 resamples. The numbers denote the proportion of time the edge was selected in the model (i.e., was not reduced to zero). GEN = gender. See Figure 1 for variable names of other nodes.

Supplemental Figure 2

Stability Analysis: Edge-Weight Accuracy (Sample 2, Entire Sample)

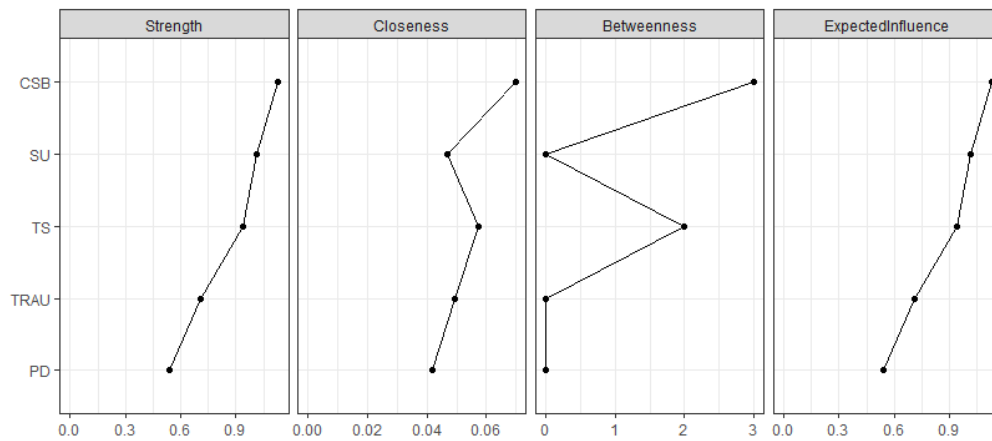


Note. The black lines denote 5% and 95% quantiles of bootstrapped statistics with 1,000 resamples. The numbers denote the proportion of time the edge was selected in the model (i.e., was not reduced to zero). GEN = gender. See Figure 1 for full variable names of nodes.

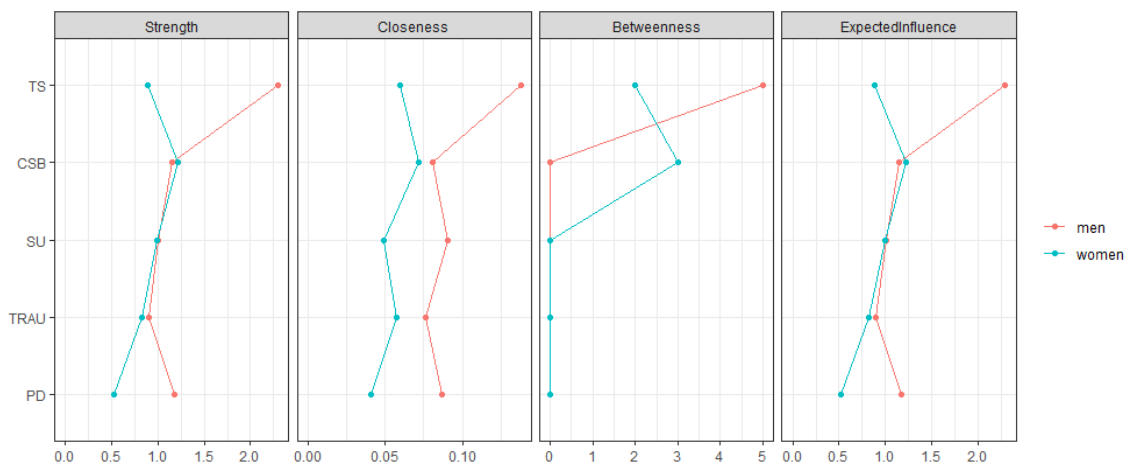
Supplemental Figure 3

Node Centrality Measures in Sample 1

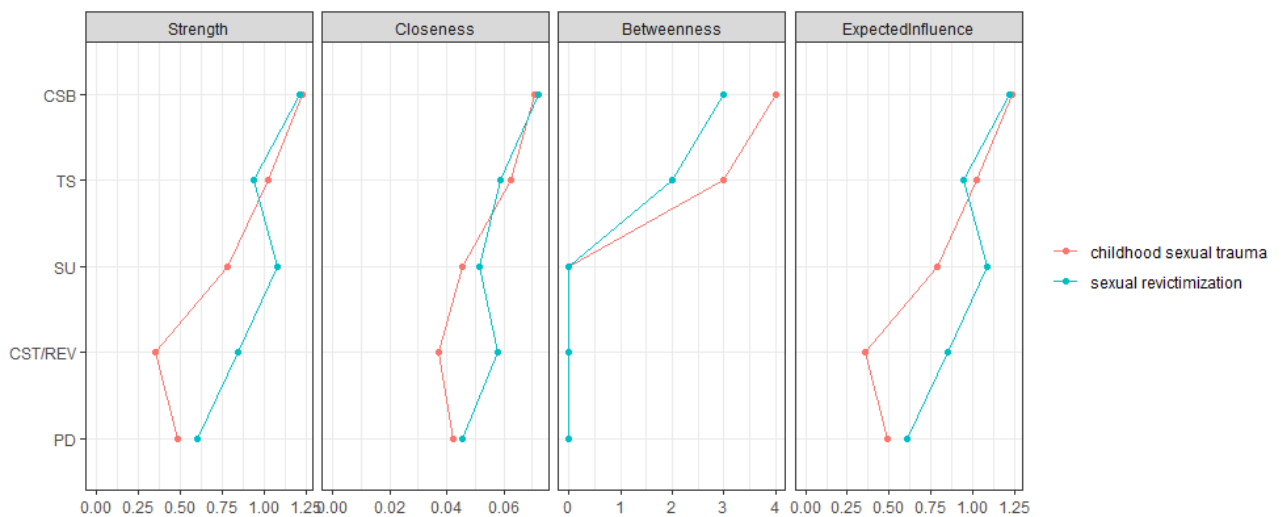
(a) Entire Sample



(b) Men Network vs. Women Network



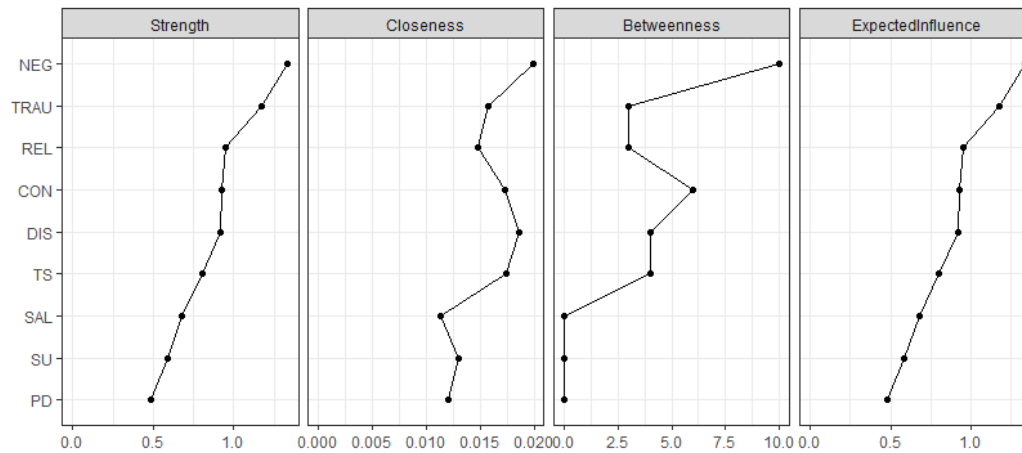
(b) Childhood Sexual Trauma Network vs. Revictimization Network



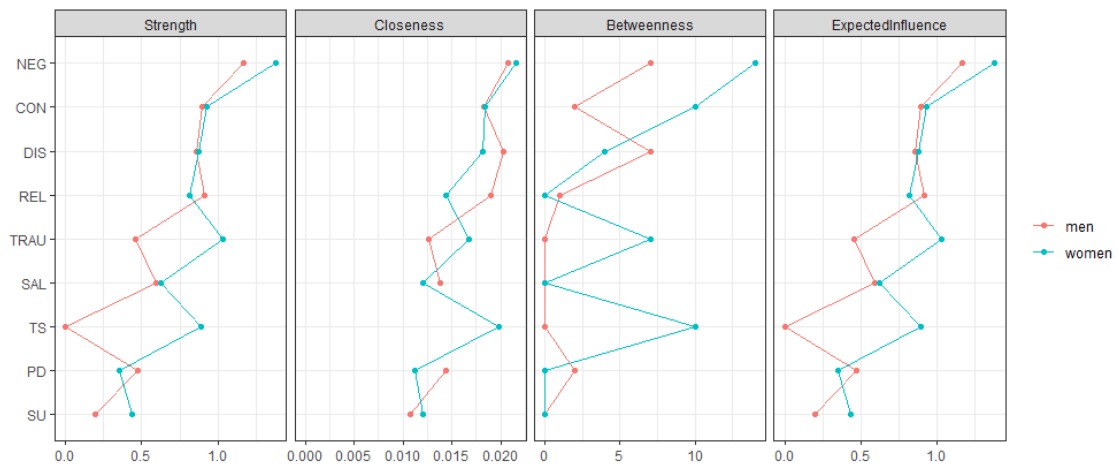
Supplemental Figure 4

Node Centrality Measures in Sample 2

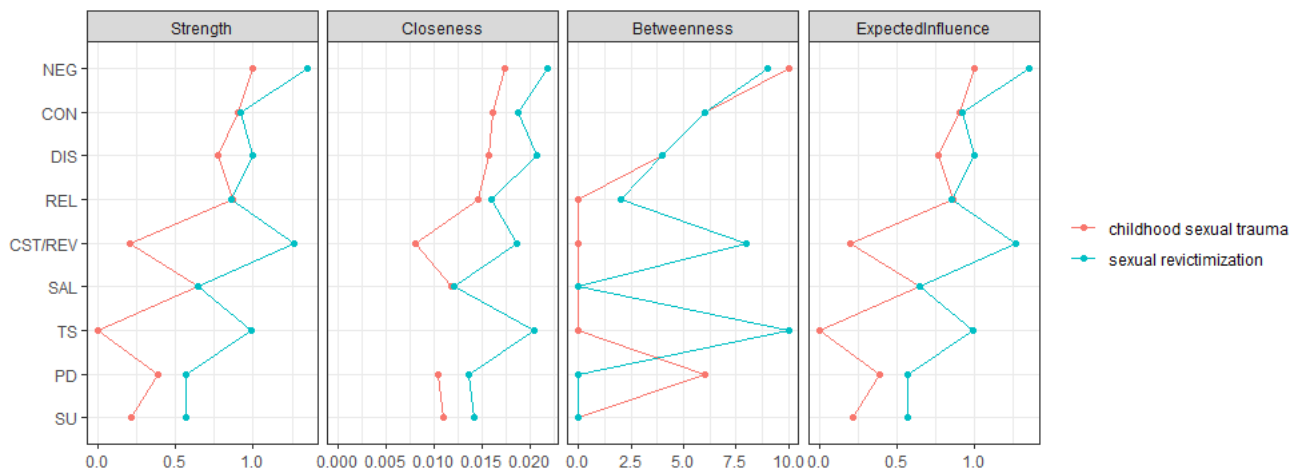
(a) Entire Sample



(b) Men Network vs. Women Network

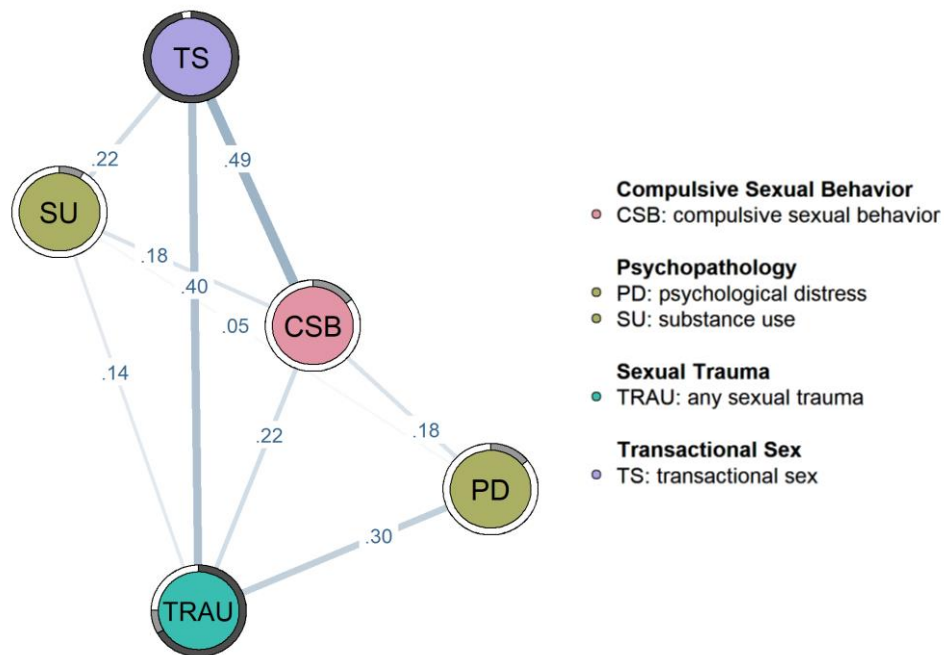


(b) Childhood Sexual Trauma Network vs. Revictimization Network



Supplemental Figure 5

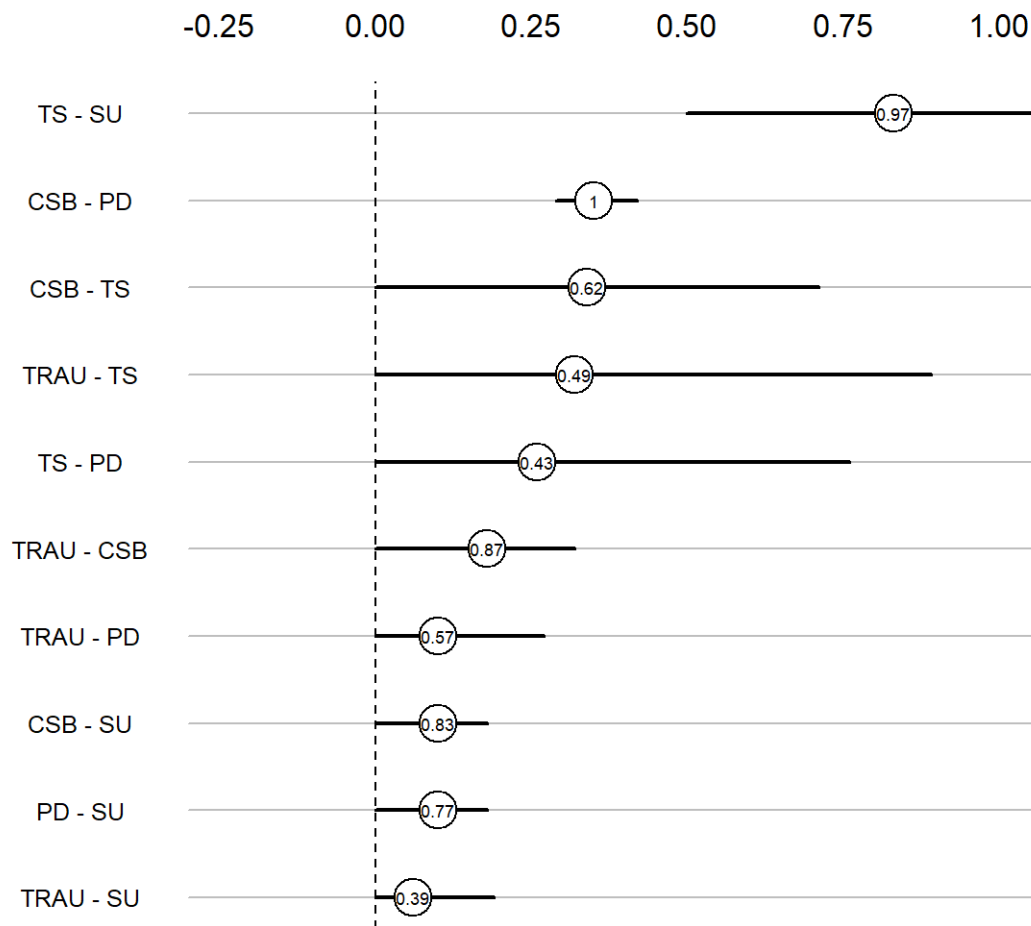
Mixed Graphical Model Network for Sample 2 (CSBD-19 Total Scores)



Note. Edge thickness represents the strength of association. All associations are positive in the network. For continuous variables, the grey area of the pie charts around the nodes represent explained variance. For binary variables, the dark grey area of the pie represents the accuracy of the intercept model, while the light grey area represents the accuracy contributed by all other variables. Gender was adjusted in the model. See Figure 1 for full variable names of nodes.

Supplemental Figure 6

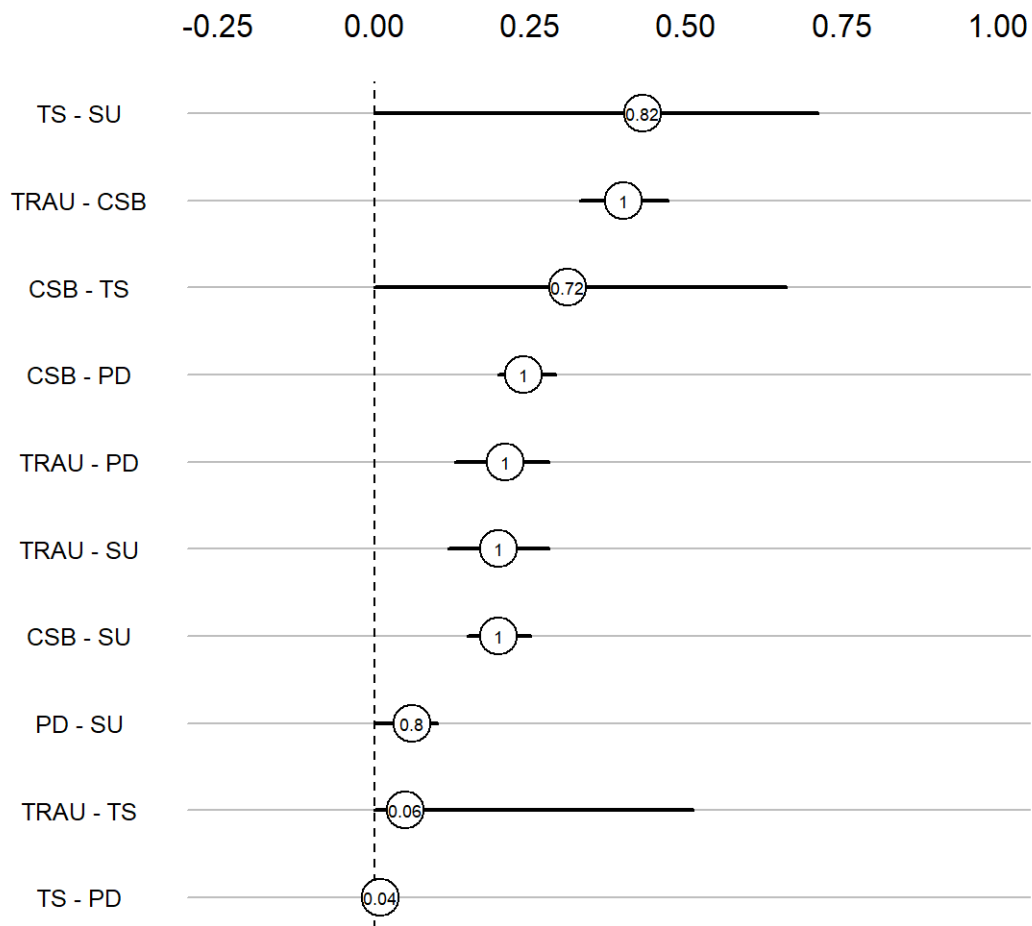
Stability Analysis: Edge-Weight Accuracy (Sample 1, Man Network)



Note. The black lines denote 5% and 95% quantiles of bootstrapped statistics with 1,000 resamples. The numbers denote the proportion of time the edge was selected in the model (i.e., was not reduced to zero). See Figure 1 for full variable names of nodes.

Supplemental Figure 7

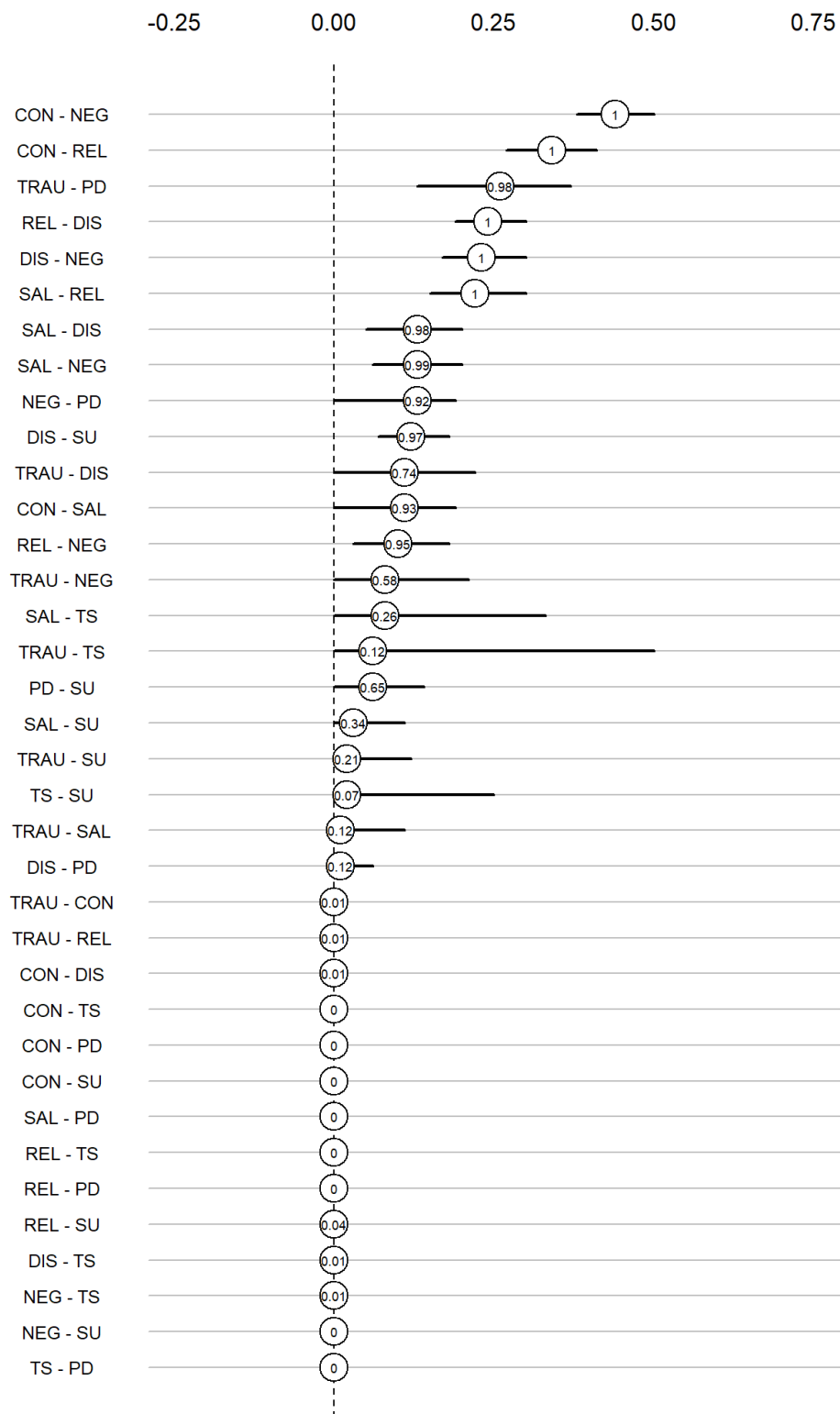
Stability Analysis: Edge-Weight Accuracy (Sample 1, Woman Network)



Note. The black lines denote 5% and 95% quantiles of bootstrapped statistics with 1,000 resamples. The numbers denote the proportion of time the edge was selected in the model (i.e., was not reduced to zero). See Figure 1 for full variable names of nodes.

Supplemental Figure 8

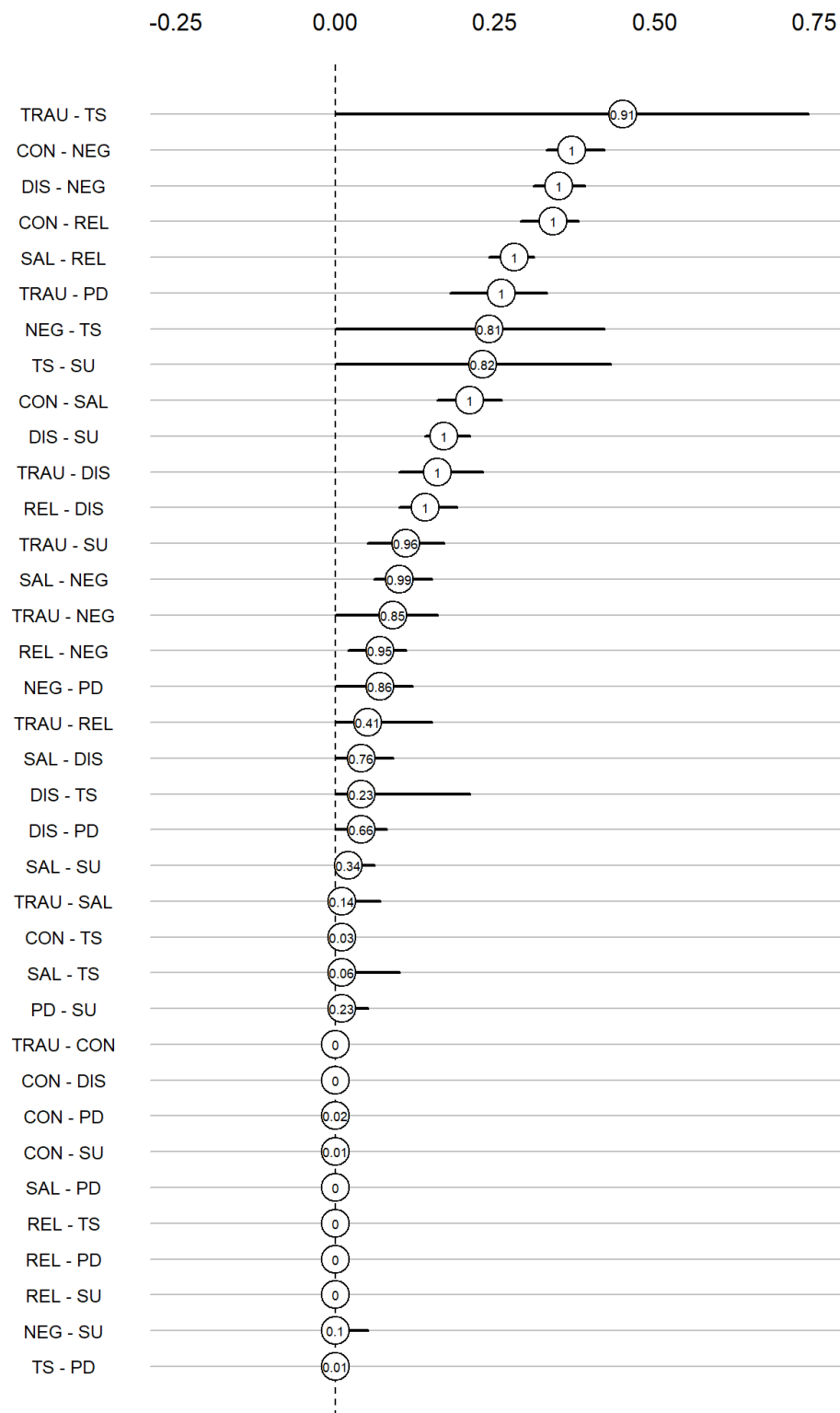
Stability Analysis: Edge-Weight Accuracy (Sample 2, Man Network)



Note. The black lines denote 5% and 95% quantiles of bootstrapped statistics with 1,000 resamples. The numbers denote the proportion of time the edge was selected in the model (i.e., was not reduced to zero). See Figure 1 for full variable names of nodes.

Supplemental Figure 9

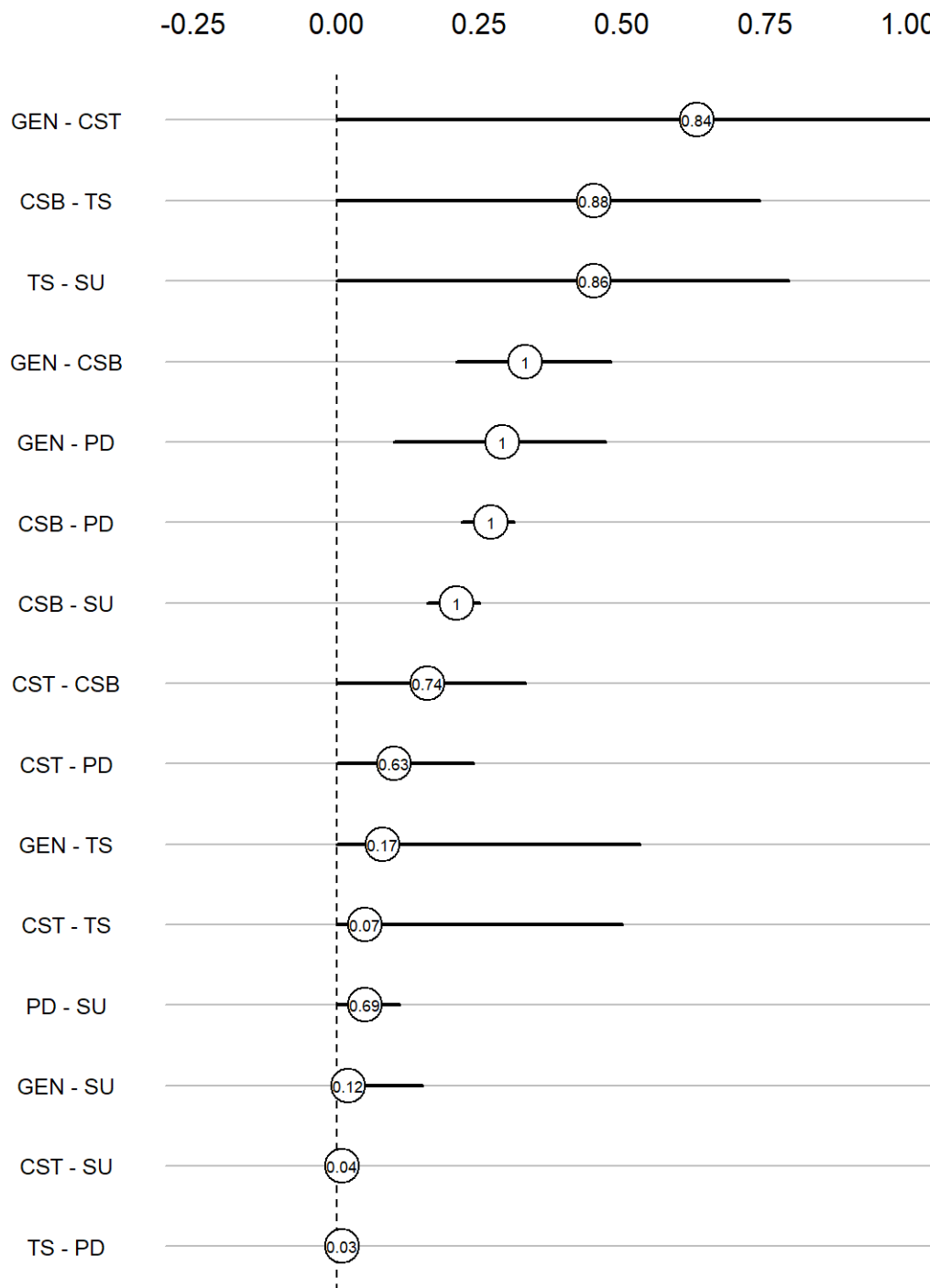
Stability Analysis: Edge-Weight Accuracy (Sample 2, Woman Network)



Note. The black lines denote 5% and 95% quantiles of bootstrapped statistics with 1,000 resamples. The numbers denote the proportion of time the edge was selected in the model (i.e., was not reduced to zero). See Figure 1 for full variable names of nodes.

Supplemental Figure 10

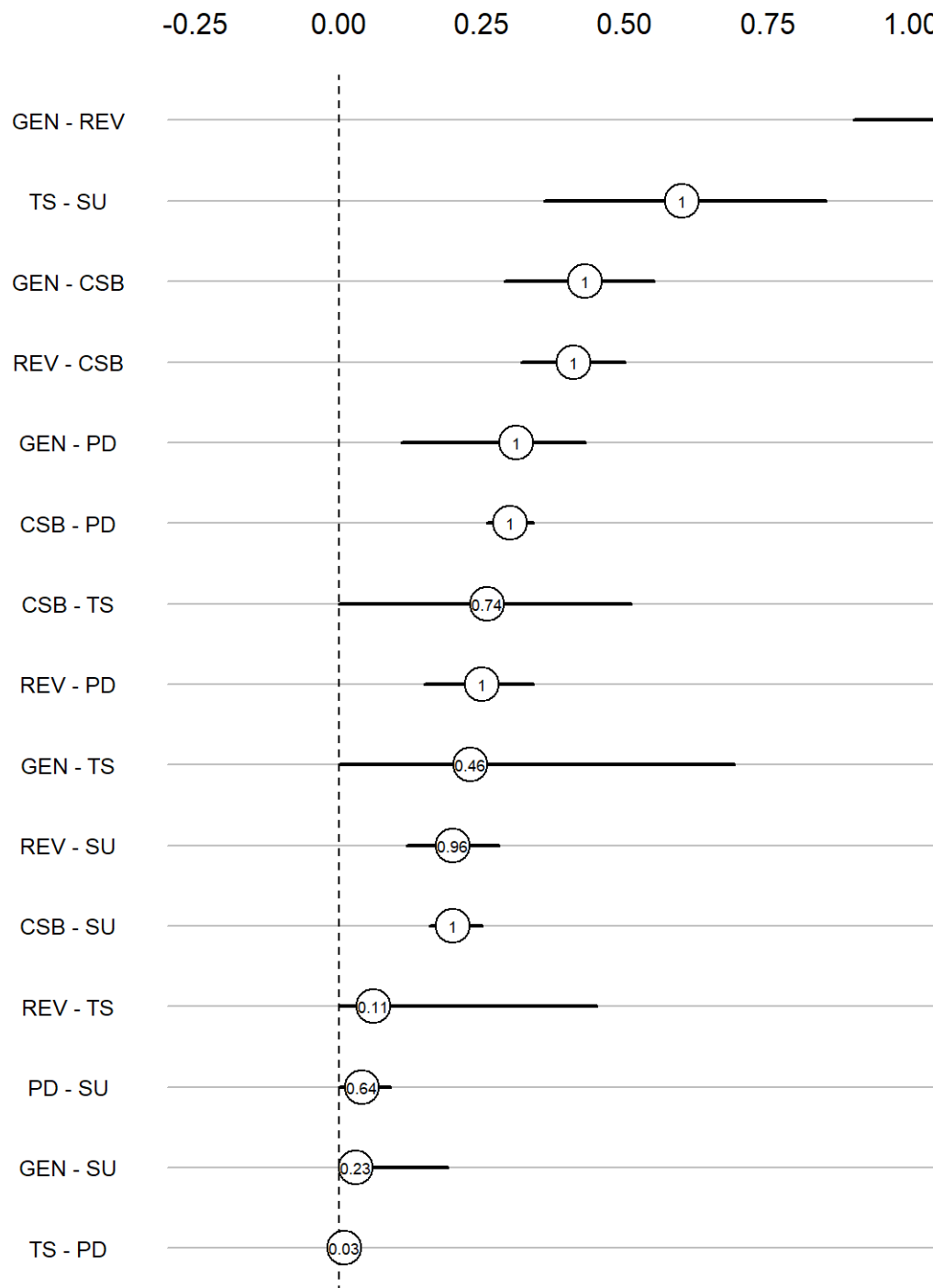
Stability Analysis: Edge-Weight Accuracy (Sample 1, Childhood Sexual Trauma Network)



Note. The black lines denote 5% and 95% quantiles of bootstrapped statistics with 1,000 resamples. The numbers denote the proportion of time the edge was selected in the model (i.e., was not reduced to zero). GEN = gender. See Figure 1 for full variable names of nodes.

Supplemental Figure 11

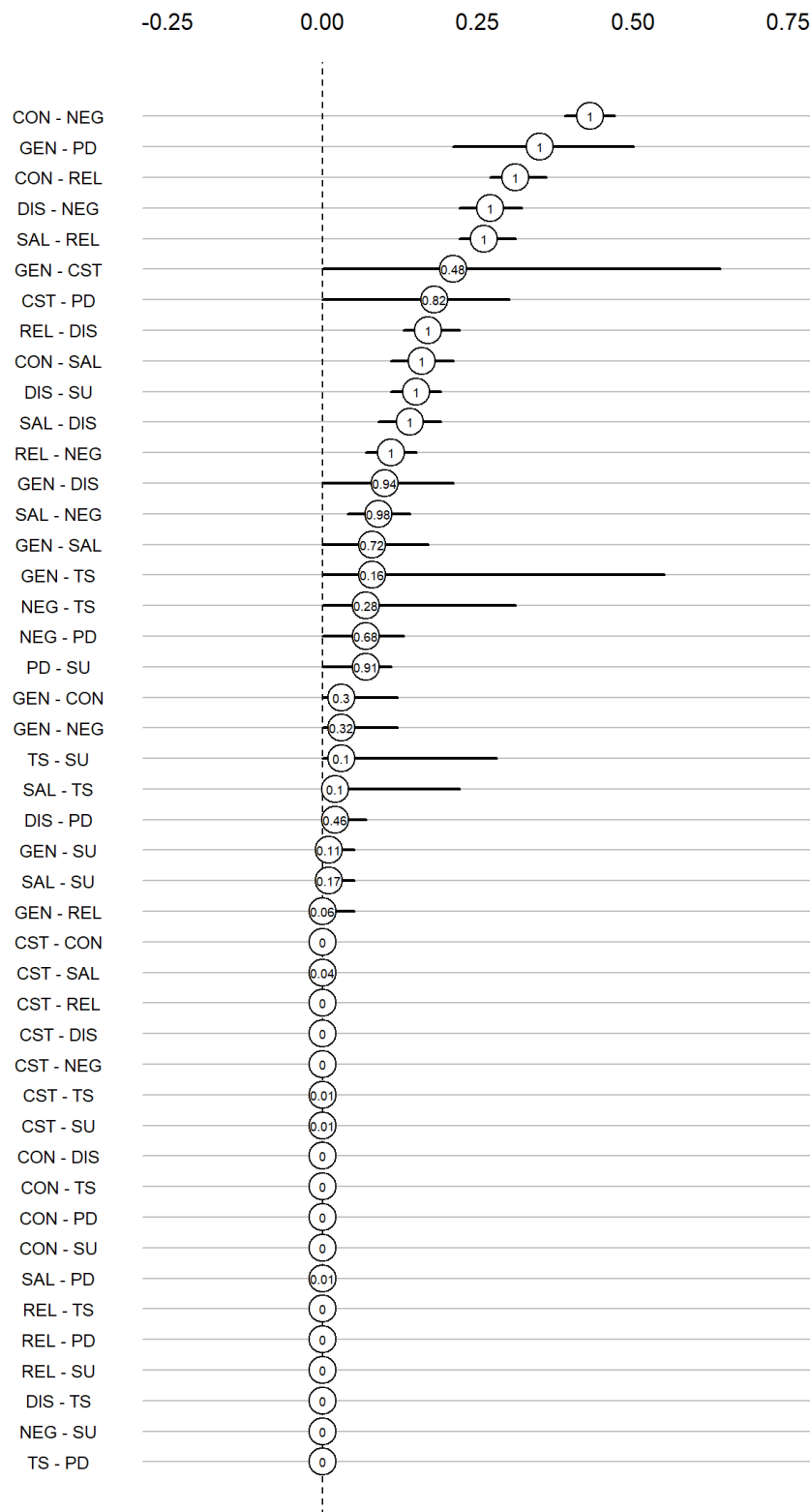
Stability Analysis: Edge-Weight Accuracy (Sample 1, Sexual Revictimization Network)



Note. The black lines denote 5% and 95% quantiles of bootstrapped statistics with 1,000 resamples. The numbers denote the proportion of time the edge was selected in the model (i.e., was not reduced to zero). GEN = gender. See Figure 1 for full variable names of nodes.

Supplemental Figure 12

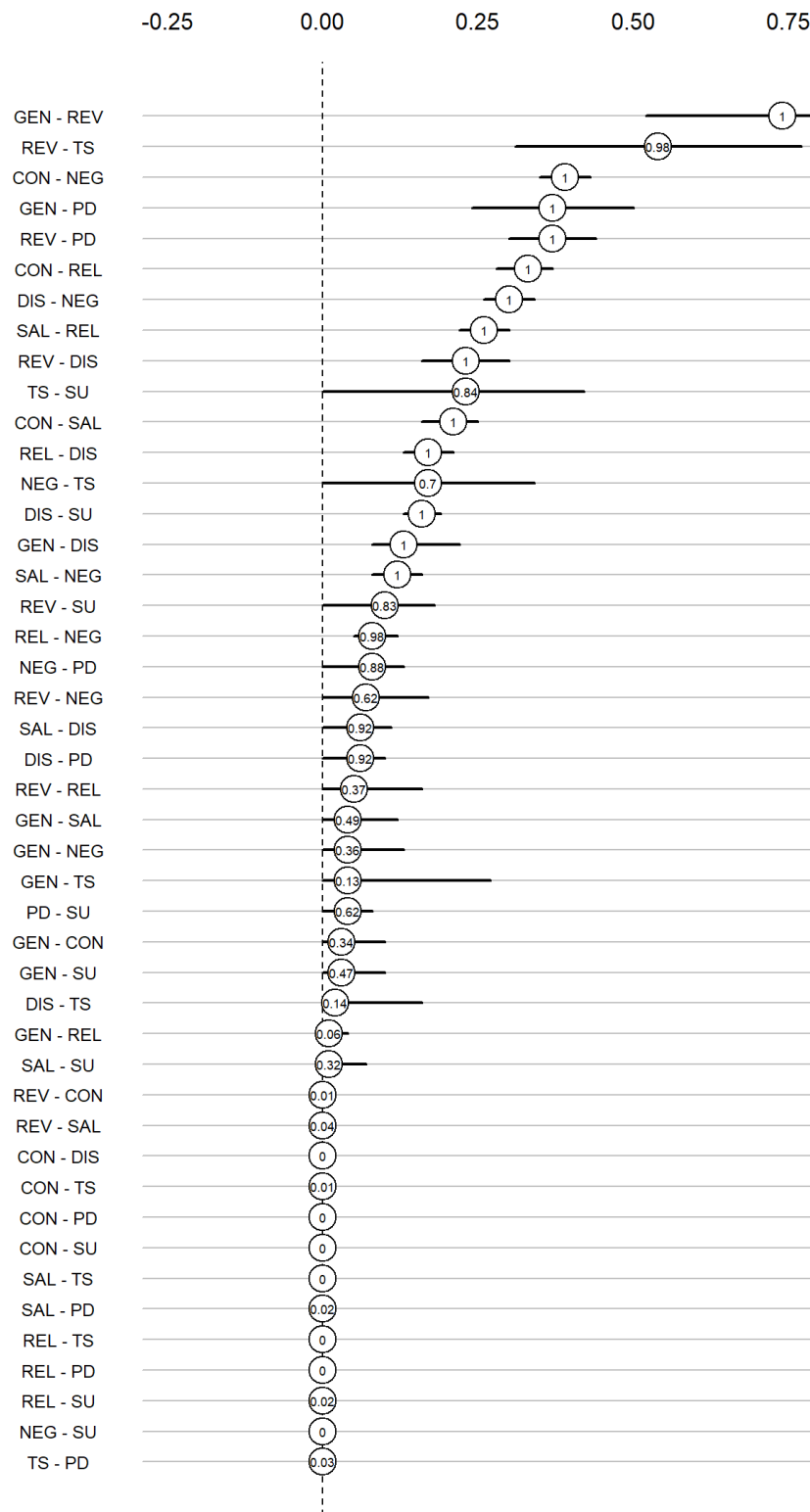
Stability Analysis: Edge-Weight Accuracy (Sample 2, Childhood Sexual Trauma Network)



Note. The black lines denote 5% and 95% quantiles of bootstrapped statistics with 1,000 resamples. The numbers denote the proportion of time the edge was selected in the model (i.e., was not reduced to zero). GEN = gender. See Figure 1 for full variable names of nodes.

Supplemental Figure 13

Stability Analysis: Edge-Weight Accuracy (Sample 2, Sexual Revictimization Network)



Note. The black lines denote 5% and 95% quantiles of bootstrapped statistics with 1,000 resamples. The numbers denote the proportion of time the edge was selected in the model (i.e., was not reduced to zero). GEN = gender.

References

- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorder* (5th ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>
- Bóthe, B., Potenza, M. N., Griffiths, M. D., Kraus, S. W., Klein, V., Fuss, J., & Demetrovics, Z. (2020). The development of the Compulsive Sexual Behavior Disorder Scale (CSBD-19): An ICD-11 based screening measure across three languages. *Journal of Behavioral Addictions*, 9(2), 247-258. <https://doi.org/10.1556/2006.2020.00034>
- Bóthe, B., Koós, M., Nagy, L., Kraus, S. W., Demetrovics, Z., Potenza, M. N., ... & Vaillancourt-Morel, M. P. (2023). Compulsive sexual behavior disorder in 42 countries: Insights from the International Sex Survey and introduction of standardized assessment tools. *Journal of Behavioral Addictions*, 12(2), 393-407. DOI: <https://doi.org/10.1556/2006.2023.00028>
- Coleman, E., Romine, R. S., Dickenson, J. A., & Miner, M. H. (2019). Compulsivity, hypersexuality, and addiction compulsive sexual behavior inventory-13. In *Handbook of sexuality-related measures* (pp. 254-257). Taylor and Francis.
- Doss, R. A., & Lowmaster, S. E. (2022). Validation of the DSM-5 Level 1 Cross-Cutting Symptom Measure in a Community Sample. *Psychiatry Research*, 318, 114935. <https://doi.org/10.1016/j.psychres.2022.114935>
- Leserman, J., Drossman, D. A., & Li, Z. (1995). The reliability and validity of a Sexual and Physical Abuse History Questionnaire in female patients with gastrointestinal disorders. *Behavioral Medicine*, 21(3), 141–150. <https://doi.org/10.1080/08964289.1995.9933752>
- Reissing, E. D., Binik, Y. M., Khalif, S., Cohen, D., & Amsel, R. (2003). Etiological correlates of vaginismus: Sexual and physical abuse, sexual knowledge, sexual self-

schema, and relationship adjustment. *Journal of Sex & Marital Therapy*, 29(1), 47-59.

<https://doi.org/10.1080/713847095>