



Exploring Patterns of Eccentricity: Insights from Network Analysis of Schizotypy in Students

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Abstract

For decades, schizotypy has proved its relevance as a useful concept for understanding schizophrenia spectrum disorders. In this paper, schizotypy was considered from a novel perspective, the network approach which conceptualizes mental disorders as dynamic systems, emerging from symptom associations. The aims of this study were to determine *central symptoms* (those most connected with others), *communities* (subgroups of symptoms that are more connected among themselves) and *bridges* (symptoms that connect communities) in a network of schizotypy symptoms. The sample consisted of 775 students, ($M_{\text{age}}=20.49$, $SD=2.35$), 83.9% females. Schizotypal Personality Questionnaire–Brief Revised (SPQ-BR) was used as a measure of schizotypy using “state of the art” network suites. The network analysis returned a sparse, stable network with 7 communities. The most central symptom and the strongest bridge was the sense of eccentricity. Some symptoms related to interpersonal problems were intensively connected with each other, suggesting the importance of this domain for the dynamics of schizotypy. The symptom predictability was substantially higher than in the previous literature and explained 41% variance. The theoretical and practical implications of the obtained results were discussed, as well as their meaning for the future perspective of schizotypy construct.

Keywords Schizotypy · Network model · Community detection

Introduction

Schizotypy can be best described as a multidimensional construct, lying on a continuum between mental health and disorder, encompassing cognitive, behavioral and personality characteristics that may be associated with vulnerability to psychosis (Grant & Hennig, 2020; Tonini et al., 2021). Its diverse manifestations highlight its heterogeneity. Factor analytic studies support the multidimensional nature of this construct, indicating that dimensions of positive, negative and disorganized symptoms can underlie both schizophrenia and schizotypy (Lenzenweger & Dworkin, 1996; Vollema & van den Bosch, 1995). *Positive dimension* of schizotypy is

characterized by the presence of odd beliefs, perceptual aberrations, suspiciousness and paranoia, *negative* consists of avolition, alogia, anhedonia, and scarce social relationships and *disorganization* incorporates the impaired ability to organize and express thoughts and behavior (Kwapil & Barrantes-Vidal, 2015). Although the three-factor model of schizotypy is widely accepted, other different dimensions were also proposed, such as impulsive-nonconformity (Mason et al., 1995), paranoia or social anxiety (Horton et al., 2014).

According to the so-called prodromal or high-risk approach (Debbané & Barrantes-Vidal, 2015), schizotypy is seen as an indicator of psychosis proneness, a high-risk mental state, which is, from the phenomenological standpoint, very similar to psychosis, but can vary in intensity and severity. However, schizotypy can also be defined as a relatively stable personality trait, which belongs to the domain of individual differences (Debbané & Barrantes-Vidal, 2015). This follows the viewpoint of Claridge and colleagues in that schizotypy represents a “natural variation of the central nervous system”, and manifests itself only in its extreme forms as vulnerability to mental disorder (e.g.; Rawlings et al., 2008). Yet, it seems that the debate between

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these standpoints may seem less relevant today, as now it is possible to empirically test continuous genetic and phenotypic risk models of schizotypy (Fonseca-Pedrero et al., 2021).

Some of the widely used instruments, which assess schizotypy, are the Oxford-Liverpool Inventory of Feelings & Experiences (O-LIFE; Mason et al., 1995) and The Schizotypal Personality Questionnaire (SPQ; Raine, 1991), based on nine diagnostic criteria from DSM-III-R (APA, 1987). The latter was succeeded by the Schizotypal Personality Questionnaire – Brief (SPQ-B) (Raine & Benishay, 1995). Finally, Cohen and colleagues (2010) created Schizotypal Personality Questionnaire – Brief Revised (SPQ-BR), to improve sensitivity of SPQ-B by introducing a Likert scale as well as to expand the domains of schizotypal manifestations by including the dimension of social anxiety. The authors proposed a seven-factor solution, along with the higher order three-factor and the four-factor solution (Cohen et al., 2010).

Network Approach to Psychopathology

Within the schizotypy literature, there has been debate about the underlying structure of the latent construct, be it categorical or (multi) dimensional (Everett & Linscott, 2015). The network theory and model, does not account for the presence of a latent factor all together. Rather, mental disorders are seen as dynamic systems which emerge from direct, bidirectional or cyclical symptom associations (Borsboom & Cramer, 2013). Within schizotypy, it seems plausible that symptoms are directly, and circularly connected due to homeostatic reasons, e.g. social disturbances -> social isolation/withdrawal (Dodell-Feder et al., 2019). Unlike latent factor modeling, symptoms are not “created equal”, and can differ in importance, that is centrality, as a function of how connected they are (Fried, 2015). Thus, intervening on a putatively antecedent and/or highly connected symptom could break the chain and stop further activation. Additionally, a more granular, symptom based analysis can potentially provide useful information about how symptoms of different disorders interact, that is, how comorbidity potentially arises (Borsboom & Cramer, 2013), including schizotypy and other disorders (Zhang et al., 2019). Finally, breaking up disorders into dynamic constituents can give valuable information about the influence of various biological and psychological aetiological factors on a symptom level (e.g. Polner et al., 2021a). Several network studies examined schizotypy (Christensen et al., 2019; Dodell-Feder et al., 2019; Fonseca-Pedrero et al., 2018a; Murphy et al., 2018; Polner et al., 2021b). In the seminal paper by Fonseca-Pedro and colleagues (2018a), the authors have found

that schizotypal traits cluster highly in three groups usually obtained by means of factorisation on SPQ items (cognitive-perceptual, interpersonal and disorganized), alongside the 9 group domains corresponding to the DSM-5 SPD criteria. Most central individual items belonged to the “suspiciousness”, “odd speech”, “odd behavior” and “excessive social anxiety” clusters. Several mentioned studies aimed to compare the factor solutions with network clusters, and have mirrored the three-factor structure (e.g.; Zhang et al., 2019) or the four-factor structure (e.g.; Polner et al., 2021b).

We sought to analyze a network of schizotypy symptoms measured by the SPQ-BR focusing on community detection, bridge symptom identification and determining the strongest nodes, adding to the literature concerning network structure of schizotypy. We have decided to use SPQ-BR as a measure of schizotypy in our research, as it exhibits greater sensitivity due to the Likert style of responding, in contrast to all mentioned studies which used binary data. The scale also includes the social anxiety dimension which is shown to be important for the concept of schizotypy (Cohen et al., 2010). Finally, we wanted to visually compare and contrast the obtained network with those in previous studies, as it does not seem that they have included Eastern European subsamples. We have focused on a student sample for homogeneity, acknowledging a trade-off with generalizability. This represents the first network study of schizotypy in Serbia, opening up the possibility of further cross-cultural comparisons and mental health strategies.

Method

Sample and Procedure

The sample consisted of 775 students ($M_{age} = 20.49$, $SD = 2.35$), 83.9% female, recruited from the various departments of the Faculty of Philosophy and Faculty of Sciences from University of Novi Sad, Serbia. The sample exceeds the minimum sample size for screening study between 200 and 400 ($H_0 = 0.5$, $H_a = 0.7–0.8$) according to Bujang and Adnan (2016); we used the prevalence of subclinical, unusual, psychotic-like experiences of approximately 8%, as recommended by van Os et al. (2009).

The research was conducted on the voluntary basis, online, via web-based software Google Forms. Participants were presented with the main information about the research, and they filled out the informed consent. In order to check for inconsistent responding, alternative forms with slightly different wording for three randomly chosen items from SPQ-BR were included. No significant inconsistencies were detected.

Instruments

Schizotypal Personality Questionnaire – Brief Revised

(SPQ-BR; Cohen et al., 2010). The SPQ-BR consists of 32 items presented on a five-point Likert scale. The authors proposed seven-factor solution: Ideas of reference/Suspiciousness, Odd or eccentric behavior, Constricted affect/No close friends, Odd speech, Social anxiety, Unusual perceptual experiences, Odd beliefs/Magical thinking (Cohen et al., 2010) and a higher order three- (Cognitive-perceptual, Disorganized, Interpersonal) and four-factor solutions (Cognitive-perceptual, Disorganized, Constricted affect/No close friends, and Social anxiety), which were validated by confirmatory factor analysis (Cohen et al., 2010). Reliability of the whole instrument expressed by Cronbach's alpha is 0.91 in our study.

Network Analysis

To estimate the network of schizotypal traits, we have estimated a Gaussian Graphical Model (GGM, Epskamp & Fried, 2018), a type of a pairwise Markov random field model. The network consists of nodes, herein individual SPQ-BR items, and edges, representing partial correlations between a pair of nodes after controlling for all others. The edges are undirected, weighted, representing the magnitude of the relations, with thicker edges representing stronger conditionally dependent relations. To avoid numerous, and potentially spurious associations, we have implemented a suitable method of parameter regularization, the *ggmModSelect* with Spearman polychoric correlations (Isvoranu & Epskamp, 2023).

For community detection, we have used the walktrap algorithm with 4 steps, a method for bottom-up hierarchical clustering via random walks (Pons & Latapy, 2006), previously used in study of schizotypy by Christensen et al. (2019) and suggested as a preferred method of community detection (Christensen et al., 2024).

The Fruchterman-Reingold algorithm (Frucherman & Reingold, 1991) was used for visualization, by which the nodes with stronger connections are represented more closely in the network.

All analyses were performed in the statistical software R version 4.1.0. (R Core Team, 2020). Network estimation and visualization were performed using the package *bootnet* (Epskamp et al., 2018), and the walktrap algorithm was used via the package *igraph* (Csardi & Nepusz, 2006). We have focused on node strength calculated via the *qgraph* package (Epskamp et al., 2012) and presented as regularized values, albeit we have calculated betweenness and closeness as well.

We computed node predictability, defined as the degree to which a node's variance is explained by its connected nodes, given all edges direct towards the node (Haslbeck & Fried, 2017). This measure indicates the influence of neighboring nodes on a target node, with higher predictability suggesting less impact from external factors outside the network (Borsboom, 2017; Haslbeck & Waldorp, 2018). The explained variance percentage (R^2) is visualized as a dark segment around each node. For predictability calculations, we employed the *mgm* package in R (Haslbeck & Waldorp, 2018).

For the purpose of assessing reliability of differences in edge weights and node strength we have run the bootstrap procedure on 5000 samples to produce 95% confidence intervals (CI95%) using the *bootnet* package (Epskamp et al., 2018). Centrality stability was obtained using the "case drop" bootstrap procedure and represented as a stability coefficient (CS) which represents the proportion of cases that can be dropped while retaining the correlation of at least 0.7 among original centrality indices and centrality of networks based on subsets (Epskamp et al., 2018).

Transparency and Openness

All data used in this study are publically available at <https://zenodo.org/> and can be assessed at <https://doi.org/10.5281/zenodo.7962117>. Analysis codes for this study are publically available and can be found at <https://doi.org/10.5281/zenodo.7943048>. This study design and the analysis were not pre-registered.

Results

Descriptive Statistics

Table 1 shows descriptive data for 32 items from SPQ-BR. Items 8, 10 and 17 have the highest mean values. Furthermore, values of skewness and kurtosis for all items fall within the acceptable range of -2 and +2 (George & Mallery, 2010), except for item 9 and item 13. However, according to less conservative criteria these items also meet acceptability requirements (e.g. Kline, 2011).

Network Estimation, Stability and Inference

The network is represented in Fig. 1. The variable names listed in the far-right column of Table 1, called *label*, are used in networks. The network consisted of 18.55% of non-spurious connections (92/496). The average weight of connected nodes was 0.16. Community structure analysis suggested a 7-community solution (see legend in Fig. 1.)

Table 1 Descriptive statistics for 32 items from SPQ-BR

Items	Min	Max	M	SD	Sk	Ku	Label
1. Avoid places with many people (SA)	1.00	5.00	1.96	1.17	1.07	0.09	AvoidPlaces
2. Other people see me as eccentric (odd) (EB)	1.00	5.00	2.28	1.20	0.58	-0.69	PerEcc
3. Telepathy (mind-reading) (MT)	1.00	5.00	2.46	1.28	0.40	-0.98	Teleph
4. Unusual mannerisms and habits (EB)	1.00	5.00	2.43	1.19	0.45	-0.78	CommOdd
5. Jump quickly from one topic to another (OS)	1.00	5.00	2.84	1.30	0.16	-1.18	JumpSpeech
6. Not good at expressing my true feelings (CA)	1.00	5.00	2.45	1.32	0.47	-1.01	NvCom
7. The face change right before your eyes in a mirror (UP)	1.00	5.00	2.02	1.33	0.95	-0.48	FaceChange
8. Forget what I am trying to say (OS)	1.00	5.00	3.50	1.19	-0.43	-0.92	ForgetSay
9. Rarely laugh/smile (CA)	1.00	5.00	1.45	0.88	2.15	4.17	RareLaugh
10. Concerned that friends or co-workers are not loyal (S)	1.00	5.00	3.02	1.20	-0.03	-1.04	Loyal
11. Anxious when meeting people for the first time (SA)	1.00	5.00	2.26	1.25	0.67	-0.72	AnxFirstMeet
12. Clairvoyance (psychic forces, fortune telling) (MT)	1.00	5.00	2.12	1.21	0.77	-0.49	Psych
13. Hearing a voice speaking my thoughts aloud (UP)	1.00	5.00	1.51	0.96	1.94	3.01	VoiceLoud
14. Hard to be emotionally close to other people (NCF)	1.00	5.00	2.07	1.22	0.89	-0.35	EmoClose
15. Ramble on too much when speaking (OS)	1.00	5.00	2.18	1.11	0.80	-0.14	DistCom
16. Feeling nervous in a group of unfamiliar people (SA)	1.00	5.00	2.65	1.27	0.39	-0.95	TnsUnknP
17. No one really close outside of immediate family (NCF)	1.00	5.00	3.19	1.42	-0.23	-1.31	NoOneClose
18. Feeling that other people are taking notice of you (IR)	1.00	5.00	2.17	1.18	0.68	-0.58	PayAtt
19. Feeling uncomfortable with unfamiliar people (SA)	1.00	5.00	2.19	1.14	0.74	-0.36	AnxSocUkn
20. Astrology, seeing the future, UFO's, ESP, or a sixth sense (MT)	1.00	5.00	1.75	1.26	1.50	0.87	Astro
21. Everyday things seem unusually large or small (UP)	1.00	5.00	2.05	1.13	0.77	-0.26	BigSmall
22. Communicating telepathically (MT)	1.00	5.00	2.04	1.32	0.91	-0.57	TeleCom
23. Wander off the topic (OS)	1.00	5.00	2.59	1.25	0.40	-0.94	WonderOff
24. Feel that others have it in for me (S)	1.00	5.00	1.67	1.02	1.53	1.56	OthHarm
25. Other people are watching you (IR)	1.00	5.00	2.57	1.26	0.29	-1.06	OthWatch
26. People are talking about you (IR)	1.00	5.00	2.77	1.14	0.10	-0.92	OthTalk
27. Thoughts so strong that you can almost hear them (UP)	1.00	5.00	2.35	1.37	0.55	-1.06	LoudTho
28. Keeping an eye out to stop people from taking advantage of you (S)	1.00	5.00	2.81	1.29	0.12	-1.16	CautionUse
29. Cannot get "close" to people (NCF)	1.00	5.00	2.07	1.25	0.93	-0.32	NoCloseness
30. Odd, unusual person (EB)	1.00	5.00	2.21	1.30	0.77	-0.58	UnuPers
31. Eccentric (odd) habits (EB)	1.00	5.00	2.20	1.28	0.76	-0.61	ExxHab
32. Keep feelings to myself (CA)	1.00	5.00	3.00	1.35	0.02	-1.27	EmoMyself

Note Abbreviations in brackets denote 9 factors according to Raine (1991): *SA* – Social Anxiety, *EB* – Eccentric Behaviour, *MT* – Magical Thinking, *OS* – Odd Speech, *CA* – Constricted Affect, *UP* – Unusual Perceptions, *S* – Suspiciousness, *NCF* – No Close Friends, *IR* – Ideas of Reference

As for node predictability, the average R^2 for all nodes was 0.41. The items with most variance explained by other nodes deal with social anxiety (e.g., “I feel very uncomfortable in social situations involving unfamiliar people.”, 0.62). Item with least predictability was: “When you look at a person or yourself in a mirror, have you ever seen the face change right before your eyes?” (0.19). Based on the person-based bootstrapping procedure, the results suggest a satisfactory measure of stability (Appendix A). The CS coefficient was 0.75 (minimal value = 0.67, maximum value = 1).

The analyses suggest that there are 11 items with the regularized measure of centrality higher than 1, most central being “I am an odd, unusual person.” ($Z = 1.31$), which was significantly stronger than 25 nodes (see Appendix B.). It was followed by “Do you tend to wander off the topic when having a conversation?” ($Z = 1.24$), significantly stronger

than 21 nodes, and “Do you feel that you cannot get “close” to people?” ($Z = 1.21$), being statistically stronger than 19 nodes. All centrality indices are in Fig. 2.

Three indicators had the bridge strength value higher than 1. The indicator highest in bridge strength was “I am an odd, unusual person” with 7 associations outside its community and was connected to Constricted Affect /No Close Friends the most. Bridge centrality parameters are in Fig. 3.

Discussion

A sparse, accurate and stable network (Appendix C) with 7 communities was obtained - Ideas of reference/Suspiciousness, Odd beliefs/Magical thinking, Odd speech, Social anxiety, Constricted affect/No close friends, Unusual perceptual experiences and Odd or eccentric behavior. These

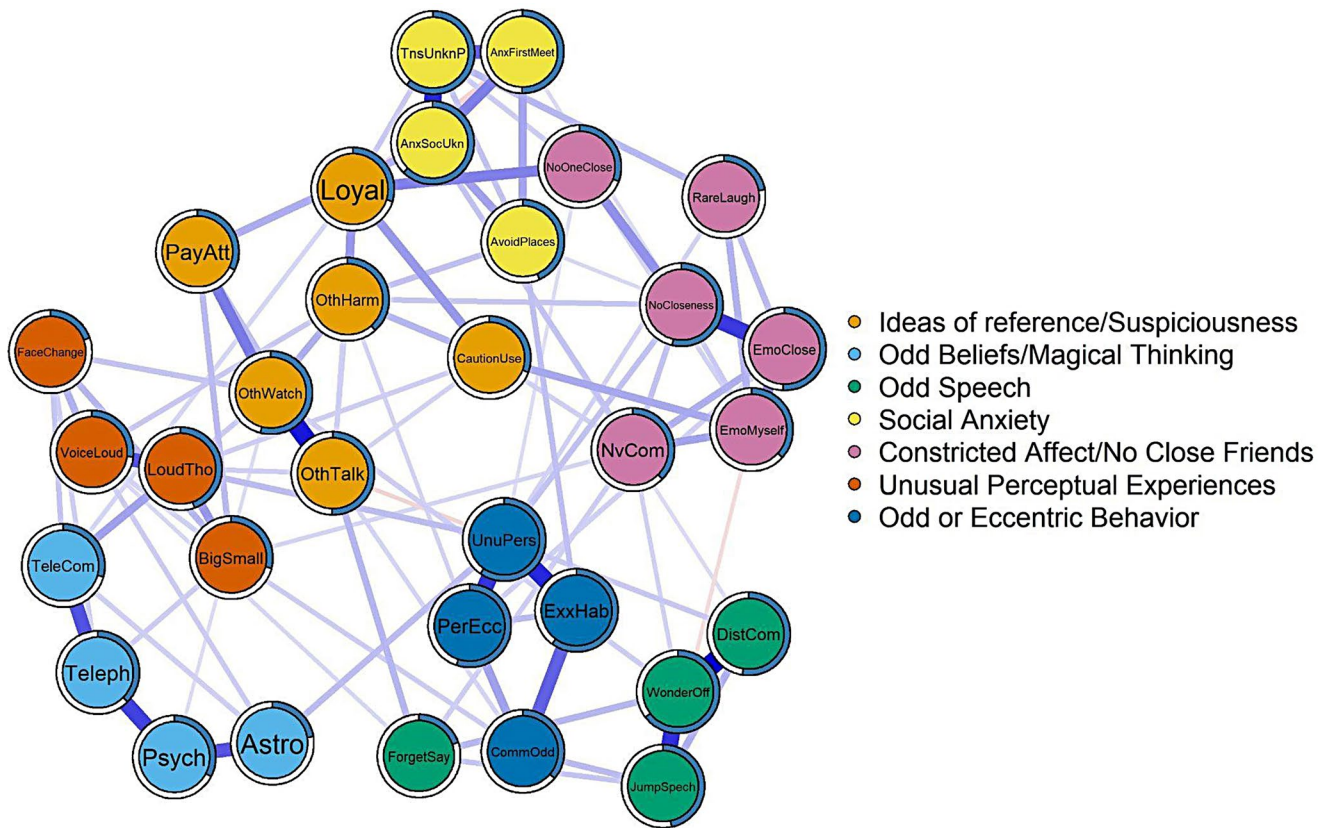


Fig. 1 Network of schizotypy indicators in the SPQ-BR questionnaire space

communities exactly mirror the seven-factor solution in Cohen et al.'s study (2010). In line with the results in Murphy et al. (2018), but in contrast to the solution found in Fonseca-Pedrero et al. (2018a), pairs of items: (a) No close friends/Constricted affect and (b) Suspiciousness/Ideas of reference, merged as communities here, albeit the latter authors did report that these two pairs were strongly connected. This finding could imply that ideas of reference/suspiciousness and poor rapport/no close friends have a tight internal interplay and can bidirectionally affect each other. Interpersonal sensitivity is a trait which is tightly connected to paranoid thinking in clinical and general populations (Meisel et al., 2018) as well as to schizotypal personality (Hodges et al., 1999). In another study, loneliness has been shown to predict paranoia, for example (Lim et al., 2016).

As is the case with our research, studies which relied on community detection algorithms (e.g. Polner et al., 2021b) and those that did not (e.g.; Zhang et al., 2019) consistently obtained networks that are in line with the factor solutions proposed by the authors of the instruments. In our study the most central item was “I am an odd, unusual person.” from the Odd or Eccentric behavior community, followed by symptoms which concern interpersonal problems. This is completely in line with centrality indices obtained in study by Dodel-Feder et al. (2019). Also, Murphy et al. (2018)

reported that within a subsample of individuals with high symptom severity, acting strange had highest centrality and was tightly connected to the mentioned oddity item, which supported the importance of this item within high risk individuals too. Our results demonstrate that the indicator with most connections implies the general insight of being unusual, concerning different domains and problems, especially interpersonal ones. This indicator was also one of the strongest bridges among communities suggesting that through this generalization, other groups of symptoms are easily activated, and vice versa, different groups of symptoms all end up in this global self-conception. It seems that recognizing one's oddity, i.e. eccentricity as a key self description is a sort of omnibus characteristic of schizotypy, either as a trait or disorder. Kemp et al. (2022) supported the last notion by finding that sense of eccentricity was significantly associated with all three schizotypy dimensions (positive, negative and disorganization), using both measures of normal personality and personality disorder. Similarly, Murphy and colleagues (2018) suggested that the nature of metacognition about one's experiences can be a significant outcome factor in delineating clinical and nonclinical psychotic-like experiences. Therefore, although a sense of eccentricity as an indicator is not specific in itself, it might

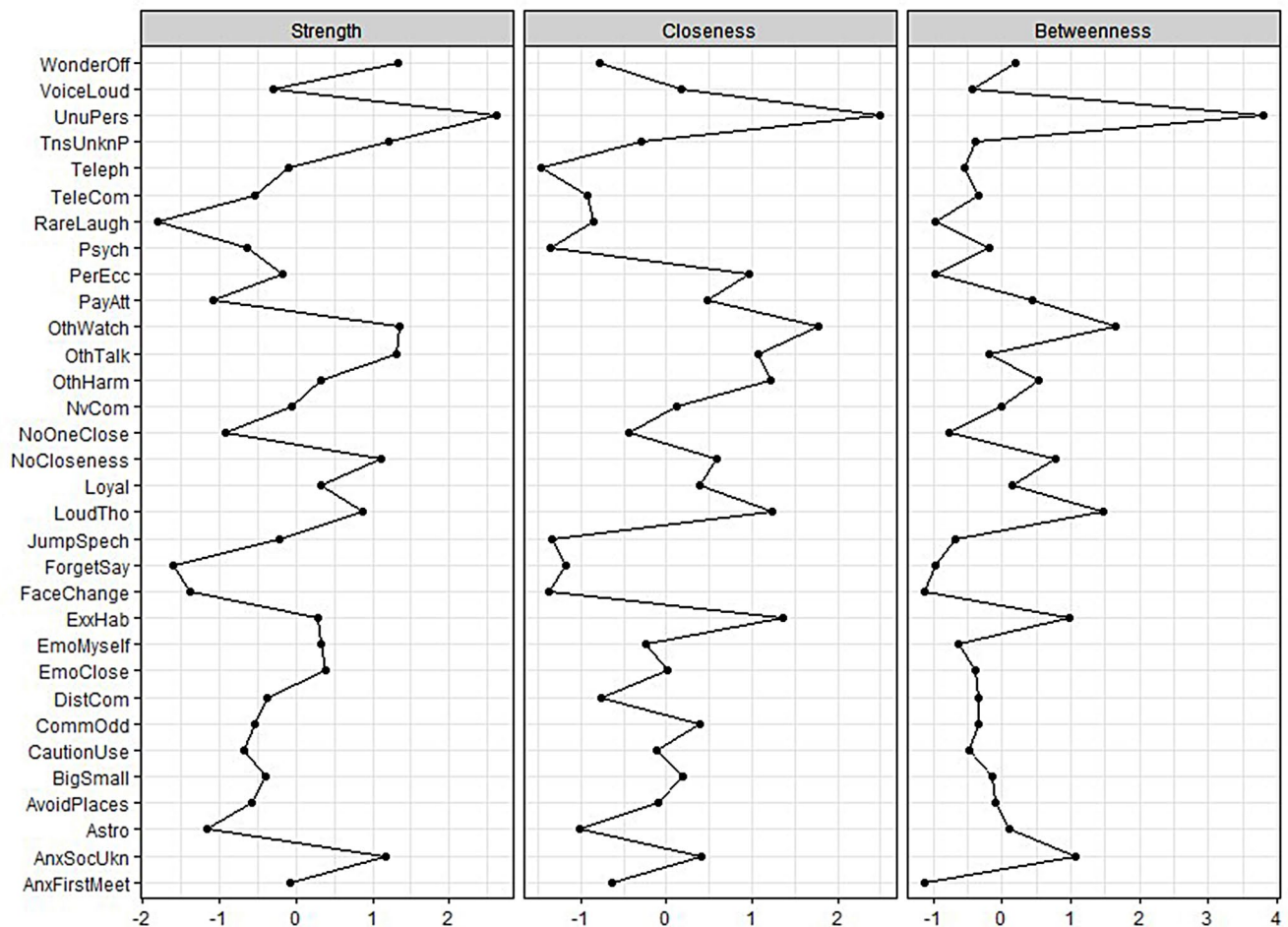


Fig. 2 Centrality indices for the SPQ-BR items

bear considerable informativeness during the initial clinical assessment.

Some items related to interpersonal problems had similarly high strength (“Do you feel that you cannot get “close” to people?”), and bridge centrality among communities (“I sometimes avoid going to places where there will be many people because I will get anxious”). Items dealing with social anxiety (uncomfortable in social situations, nervous with unfamiliar persons) are also those that are most explained by other symptoms. Interestingly, both Zhang et al. (2021) and Dodell-Feder et al. (2019) suggested that the interpersonal cluster is highly important. Social anxiety cluster in our research is located and tightly connected between Constricted affect/No close friends and Suspiciousness clusters. The close relationship between social anxiety and suspiciousness together with other paranoid tendencies is well documented in research (e.g. Horton et al., 2014). Namely, social anxiety often involves cognitive distortions where behaviors of other people are interpreted as being related to the self (Clark, 2005). Avoidance can be a common characteristic connecting social anxiety and emotional

detachment from people, governed by fear and low need for company. Additionally, social anxiety can be seen as a bridge between positive and negative symptoms of schizotypy, at least in a population with low schizotypal disorder incidence.¹ However, caution is needed regarding this interpretation, as the role of social anxiety in schizotypy, which SPQ-BR captures, remains debated (Meyer & Lenzenweger, 2009).

Predictability analysis showed an average explained variance of 41%, higher than Fonseca-Pedrero et al.’s and Dodell-Feder et al.’s studies, indicating some, albeit smaller, influence of external agents like genetics and environmental factors on schizotypy (Barrantes-Vidal et al., 2015). The most predictable nodes were related to social aspects, while perceptual and speech aberrations were less predictable, which is in concordance with previous findings (e.g., Dodell-Feder et al., 2019).

¹ Namely, in Brown et al., 2008, results support moderating effect of intensity of schizotypal characteristics in relation between social anxiety and social anhedonia.

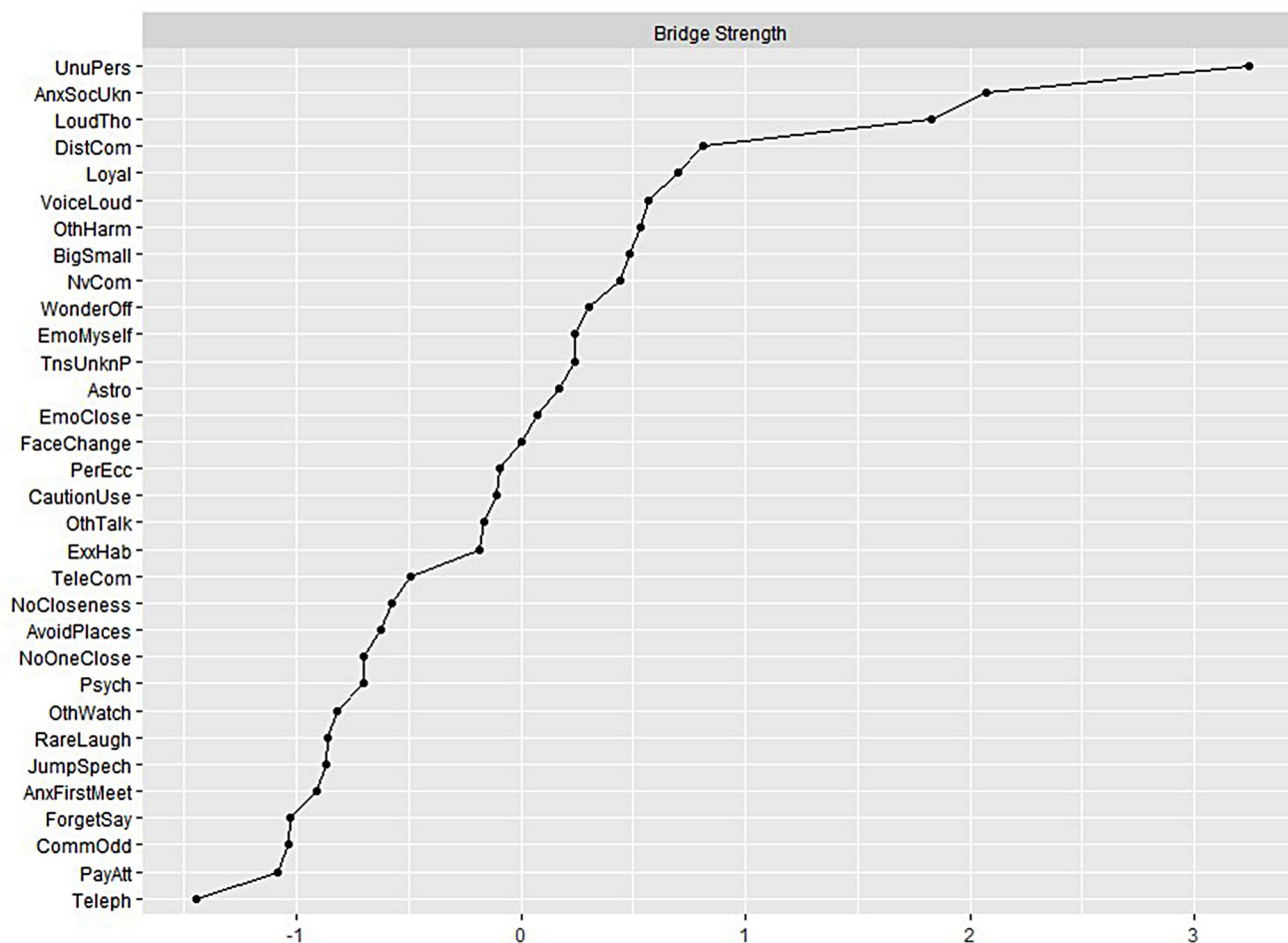


Fig. 3 Bridge strength for all nodes

The importance of oddness and interpersonal problems in the networks of symptoms may have clinical implications. This might be of special relevance bearing in mind that the area of psychological treatment for individuals with schizotypal features is still understudied and poorly developed (Nielsen et al., 2023). Network approach suggests that central nodes may be potential treatment targets, as influencing them may have significant effect on the rest of the network (Borsboom & Cramer, 2013; McNally, 2023). Thus, interventions concerning self-acceptance and the development of social skills may be useful, as there are already some promising findings that social cognition training could be beneficial for individuals with schizotypal personality features (Chan et al., 2010). Furthermore, knowing that social anxiety and suspiciousness cause individuals with schizotypy to be reserved and distrustful, forming a good therapeutic alliance should be of the highest priority (Ridenour, 2016). Individuals may also potentially benefit from normalization and destigmatization of their experiences as well. For example, Sobański and colleagues (2023) reported that feelings of being prejudiced against alongside hostility

and feelings of inferiority were most central before psychotherapy on a large cohort. Finally, “deconstructing a construct” into interacting constituents provides a possibility of focusing on different biological correlates, psychological processes and beliefs on a symptomatic, rather syndromic level (Jones et al., 2017).

The vast majority of studies have included younger and WEIRD (Western, educated, industrialized, rich and democratic (Henrich et al., 2010) samples in studying schizotypy, both in general terms and from the network perspective. However, it is well known that the cultural background, whether a majority or a minority community, implies specific social norms and values that can contribute to labeling certain behaviors as socially acceptable (e.g. creative or religious experiences) or pathological (Cheli, 2023). Therefore, including diverse samples, such as the case here, can contribute to understanding schizotypal experiences in general, as well as how symptom patterns are different or similar across cultures from a network approach.

From a systems perspective, moments in which a system transitions from one state into another can be informative

(i.e. critical transitions, Helmich et al., 2021). In the context of schizotypy, preventive interventions can hamper factors which shift the system from mere symptom presence to full-blown psychotic episodes. Future research could be aimed at identifying treatment targets which can have high influence on networks and/or prevent individuals from entering states that bring more disturbances. In other words, future studies could elucidate whether the most influential symptoms are the most destabilizing ones leading to a critical transition, or conversely can act as stabilizers, preventing a shift to more disordered states such as full-blown psychosis. Additionally, construction of idiographical networks and examination of intra-individual processes have gained traction in network science, either by network analysis or daily monitoring and intensive ecological momentary assessment (Mansueto et al., 2023). Such approaches could be examined in the future improving our understanding of how symptom systems change and evolve.

Limitations

This study relied on a student sample, including mostly female participants, which hampers generalizability, although students' samples can be informative in understanding the prodromal nature of schizotypy in relation to schizophrenia spectrum disorders. Due to the cross sectional nature of the study and item content overlap (Fonseca-Pedrero et al., 2018b), hypotheses about causality between symptoms are significantly limited.

Networks and latent models are mathematically equivalent under some conditions (van Bork et al., 2021; Marsman et al., 2018), communities can indicate a presence of a latent factor (Golino & Epskamp, 2017), and node strength seems

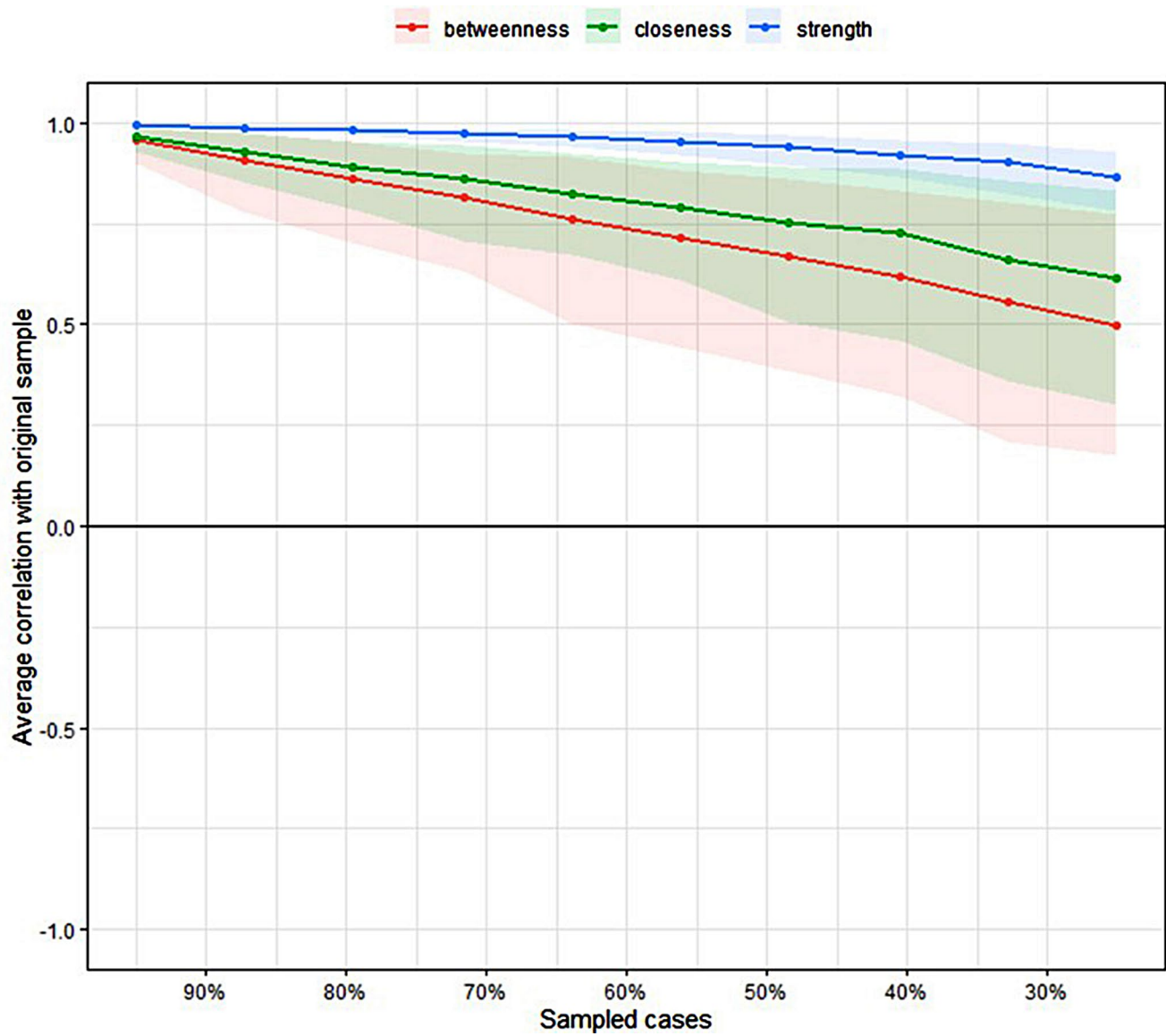
to mirror factor loadings (Christensen & Golino, 2021; Halquist et al., 2021), raising the issue of informativeness of this approach over latent modeling. Additionally, several groups of authors suggested that network model have some limitations, e.g. doubtful reproducibility and generalizability, questionable informativeness over latent modeling, network replicability and stability due to sampling variability, unreliable parameter estimates and arbitrary interpretations (for a comprehensive overview of critiques and responses see Neal et al., 2022). Finally, several studies suggested that centrality might not be the best indicator of treatment targets over endorsement and severity (e.g. Rodebaugh et al., 2018) and from a clinical perspective, some non-central symptoms can be more important (e.g. suicidal ideation in depression; Fried et al., 2017). Notwithstanding conceptual and statistical challenges, network approach does seem to show promise in improving our understanding of psychopathology by providing new avenues to explore in terms of etiology, intervention targets and system behavior analysis (McNally, 2021).

Conclusions

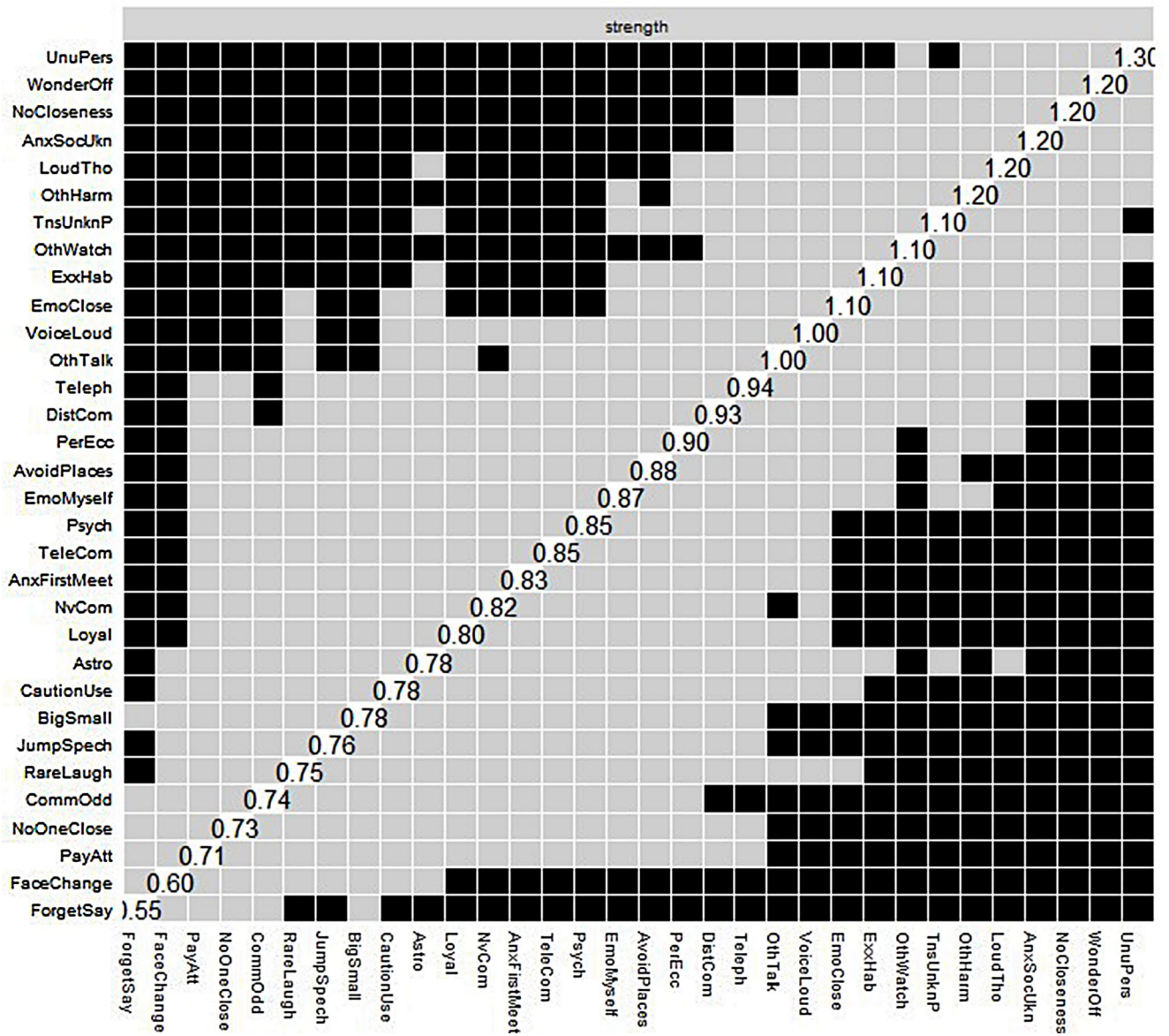
The network structure of schizotypy, within the SPQ-BR questionnaire space, was analyzed on a student sample. The resulting network aligned with Cohen et al.'s (2010) 7-factor solution, highlighting interconnected symptoms of oddity, interpersonal issues, and suspiciousness, supporting findings from several other studies. The sense of oddity and social anxiety and isolation emerged as crucial issues on which interventions should be focused to prevent network activation spread and entrance in psychopathology (Borsboom, 2017).

Appendix

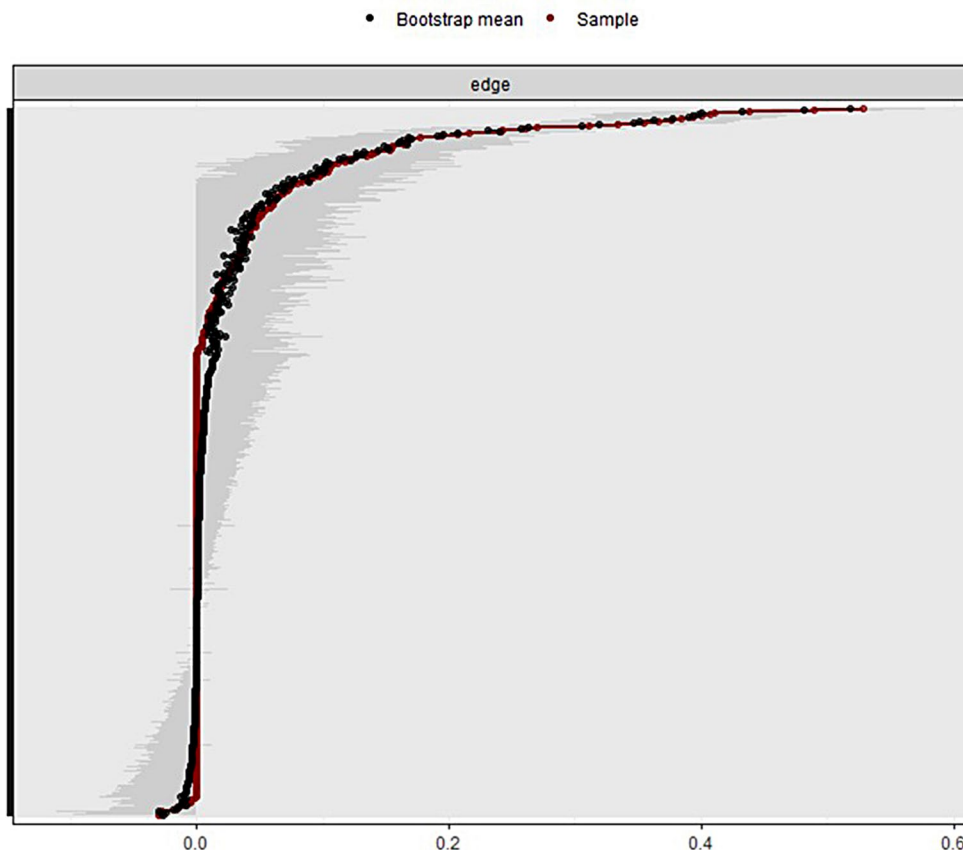
Appendix A. Centrality Stability



Appendix B. Nonparametric Bootstrapped Difference Test for Node Strength



Appendix C. Bootstrapped Edge Weights Accuracy



Author contributions Radomir Belopavlović - Conceptualization, Investigation, Formal analysis, Visualization, Writing - original draft and review/editing. Ivana Novakov - Conceptualization, Data curation, Investigation, Methodology, Project administration, Resources, Writing - original draft and review/editing. Zdenka Novović - Conceptualization, Formal analysis, Resources, Visualization, Writing - original draft and review/editing.

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Declarations

Ethical Approval The manuscript is accordance with the Declaration of Helsinki.

AI and AI-assisted Technologies Statement The authors did not use such technologies.

Conflict of Interest No potential conflict of interest was reported by the author(s).

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