

Deconstructing trait anxiety

A network perspective

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States versus traits

Long and controversial history...

(e.g., Allport, 1966; Carr & Kingsbury, 1938; Zuckerman, 1960; 1983)

Best construed as occurrent and dispositional

- State designates an experience that occurs in time
- Trait designates an inferred disposition to experience certain psychological states

(Fridhandler, 1986; McCrae & Costa, 1995, Ryle, 1949)

Anxiety research

State anxiety

**An emotional episode provoked by
the anticipation of threat**

&

Trait anxiety

**A disposition to experience heightened
state anxiety**

(e.g., Eysenck, 1983; Spielberger, Gorsuch, Vagg, & Jacobs, 1983)

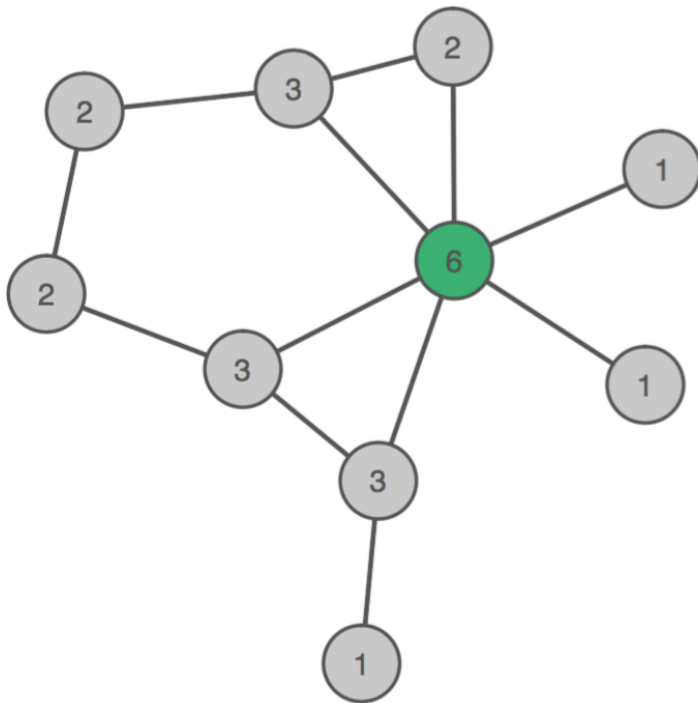
Trait Anxiety

Key construct in anxiety research

- Potential hidden « **generator** » of anxiety disorders
- Renders individuals more « **vulnerable** » to the development of anxiety and related psychopathology

(e.g., Bishop & Forster, 2013; Eysenck, Derakshan, Santos, & Calvo, 2007; Mathews & Mackintosh, 1998; Weems et al., 2007; for a review, see Gidron, 2013)

Network theory of personality

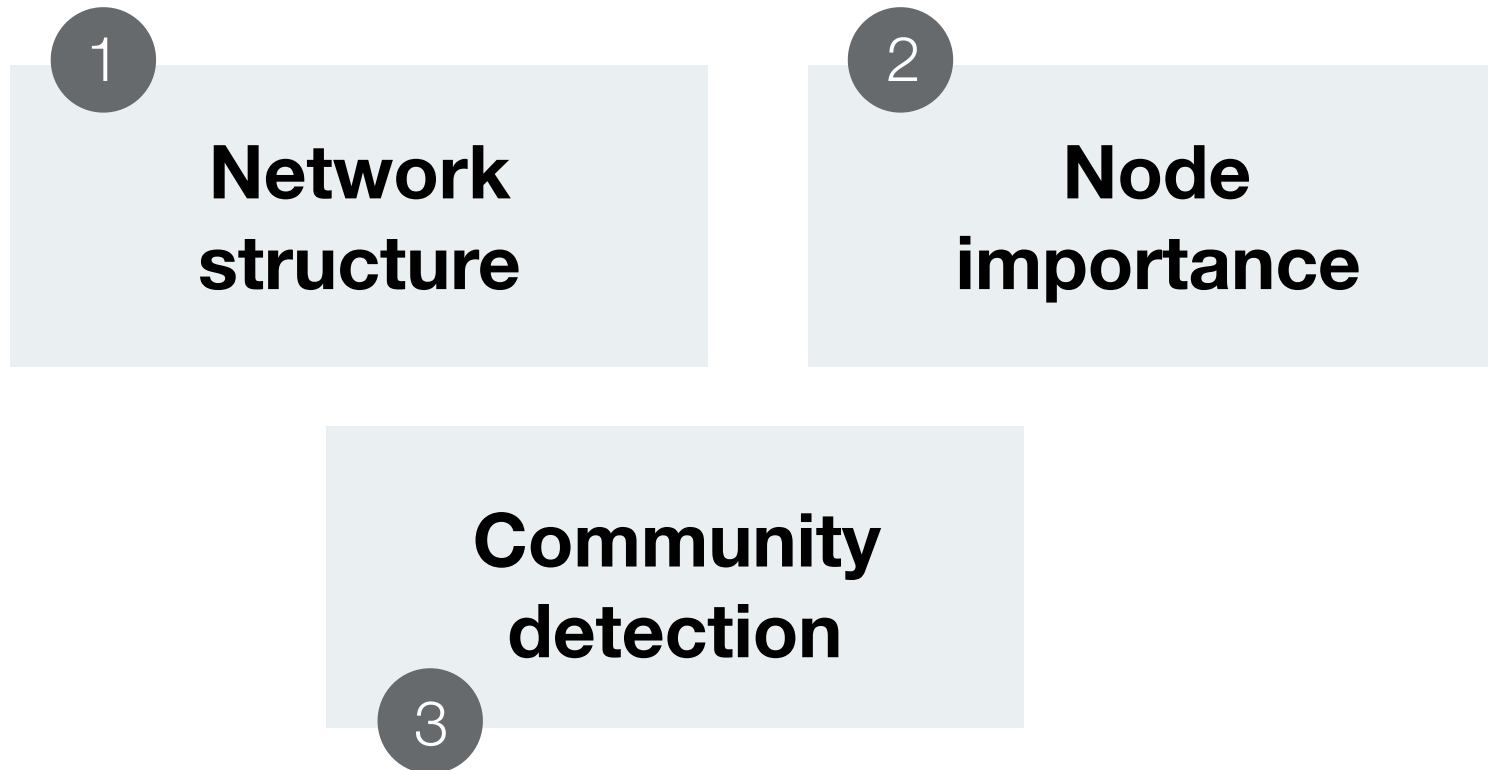


- Personality trait as a « **formative** » construct
- \times regarding personality construct as the underlying cause of the thoughts, feelings, and behaviors that supposedly reflect its presence
- **Emergent consequence** of the interactions among the constitutive elements

**Uncertainty abounds regarding
whether the features of trait
anxiety can be conceptualized
as a network system?**

The **research** aims

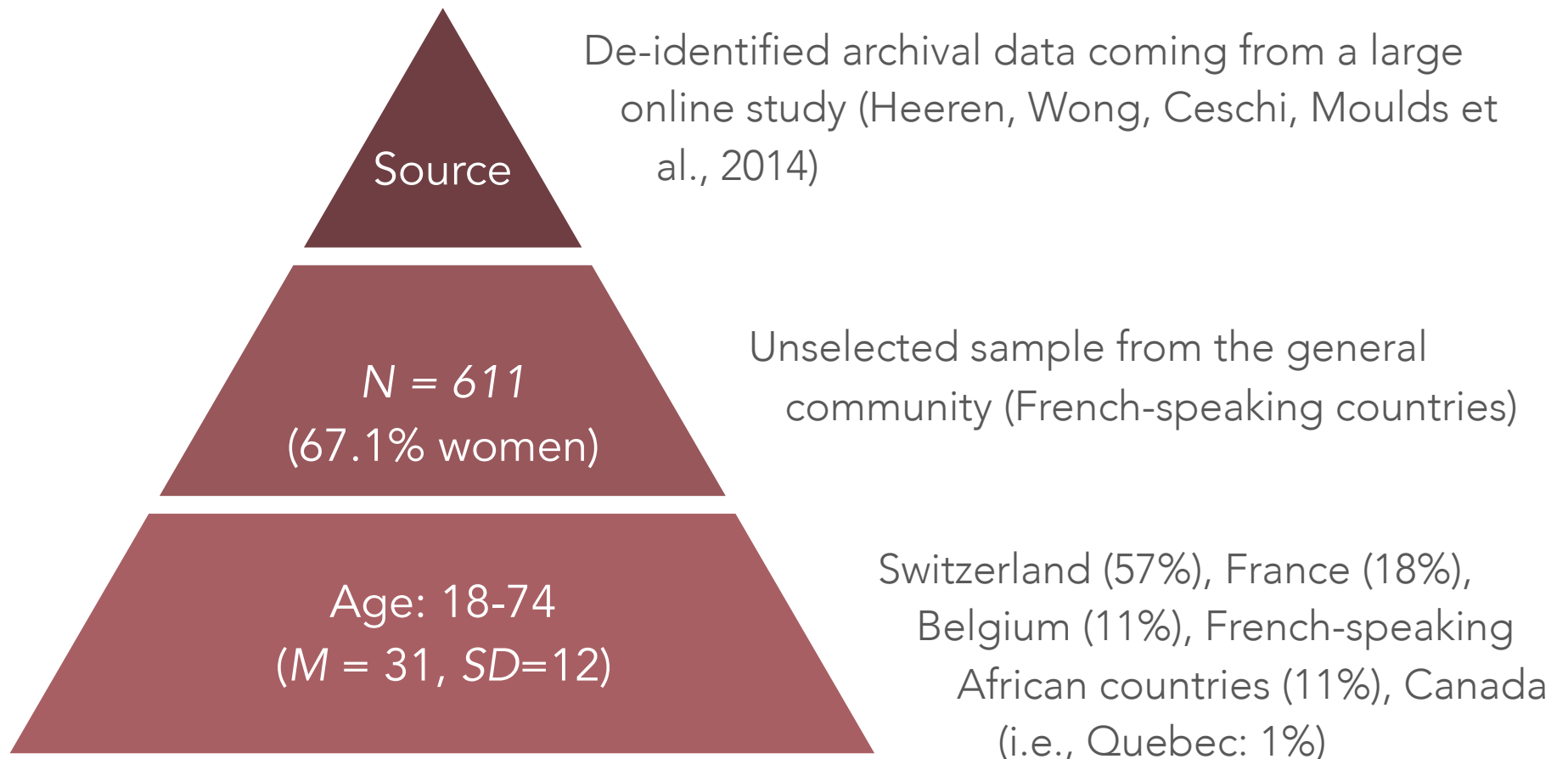
A network approach to trait anxiety:





Methods

Participants



Materials

State-Trait Anxiety Inventory (Form Y; Spielberger et al., 1983)

Trait anxiety (STAI-T)

- 20-item scale (participants are told to respond in reference to how they generally feel)
- e.g., *I have disturbing thoughts; I feel nervous and restless; I get in a state of tension or turmoil as I think over my recent concerns and interests; I am a steady person*
- 4-point Likert-type (1, Almost Never; 2, Sometimes; 3, Often; 4, Almost Always)
- Validated French version (Spielberger et al., 1993)
- Items denoting the absence of anxiety (e.g., *I feel rested; I am a steady person*) were reverse scored
- Cronbach's alpha of .87 in the current sample

Data analytic procedure

Network estimation and visualization

- Regularized partial polychoric correlation network
- Graphical LASSO (Friedman, Hastie, & Tibshirani, 2008)
- This procedure limits spurious associations & shrinks trivially small associations to 0
- R package *qgraph* (Epskamp et al., 2012)
- γ was set to 0.5 to be confident that our edges are genuine

Data analytic procedure

Centrality analysis

- R package *qgraph* (Epskamp et al., 2012)
- Betweenness, Closeness, & Strength (Freeman, 1978/1979; Opsahl et al., 2010)
- The **betweenness** centrality of a node equals the number of times that it lies on the shortest path length between any pair of other nodes
- **Closeness** centrality indicates the average distance of a node from all other nodes in the network, and is computed as the inverse of the weighted sum of shortest path lengths to a given node from all other nodes in the network.
- **Strength** of a node is the sum of the weights of the edges attached to that node
- z-scored metrics

Data analytic procedure

Modularity-based community detection

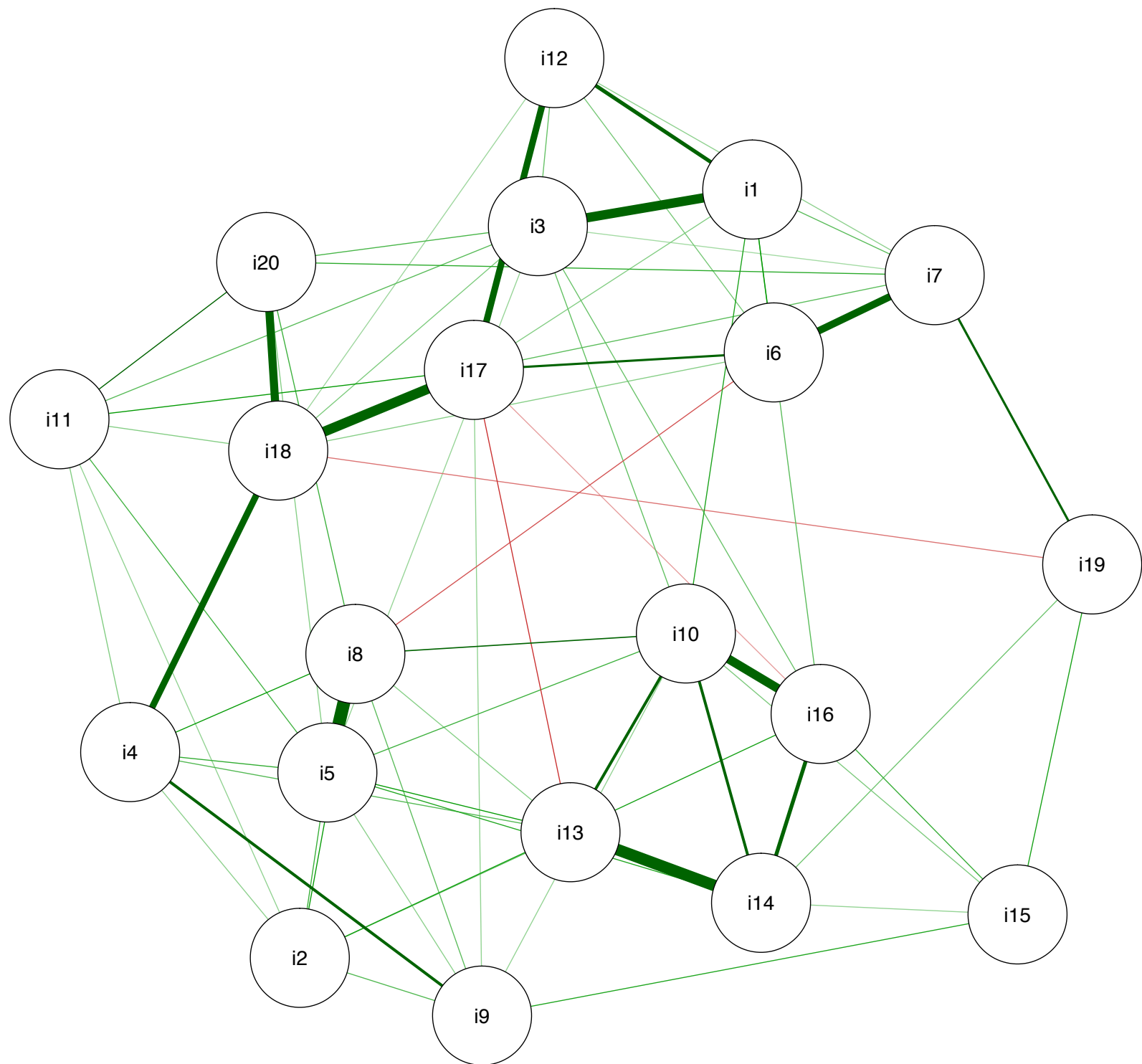
- R package *igraph* (Csardi & Nepusz, 2006)
- Spin glass algorithm (Reichardt & Bornholdt, 2006)
- $\gamma = 1$, start temperature = 1, stop temperature = .01, cooling factor = .99, spins = 20



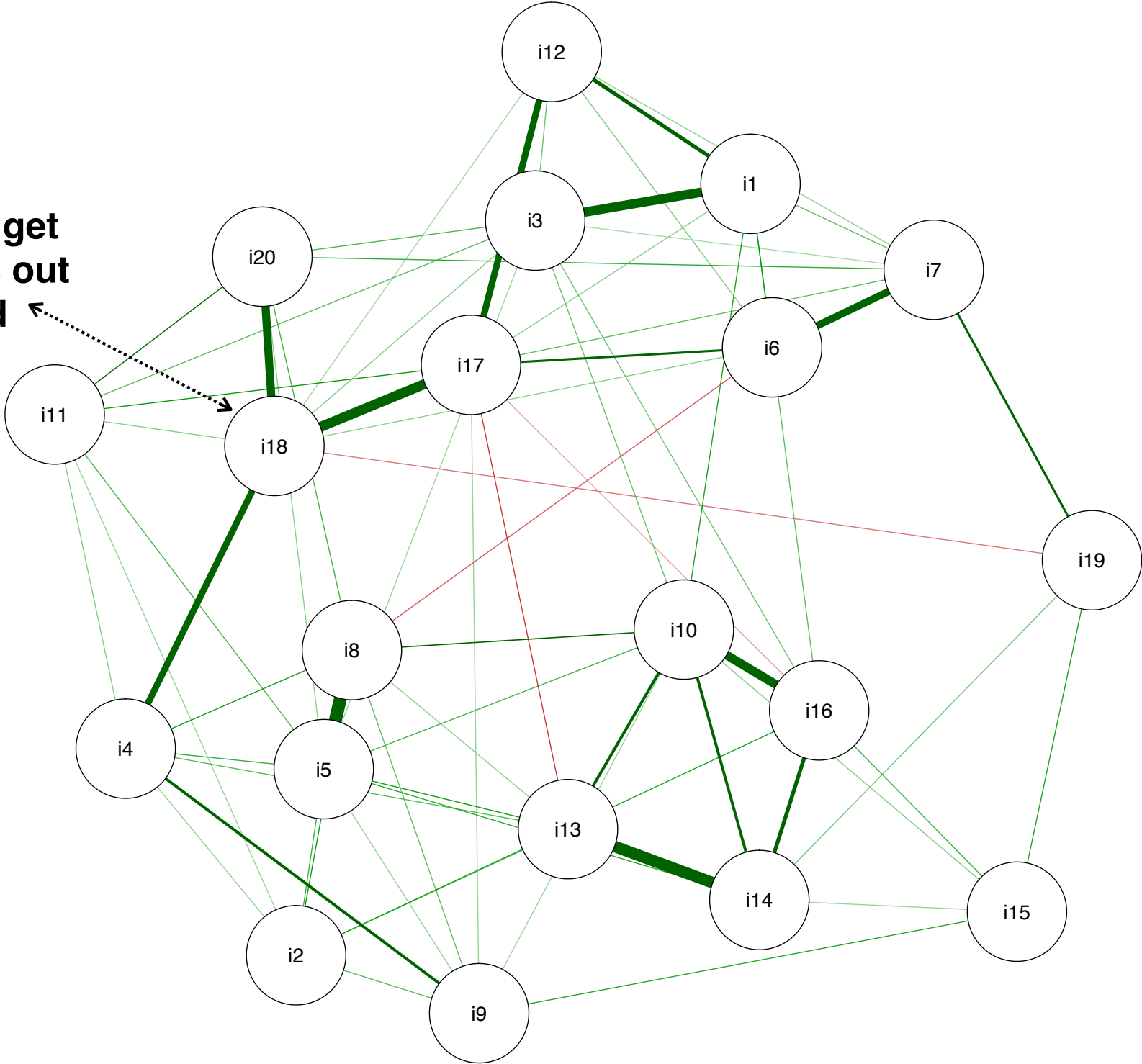
Results

1

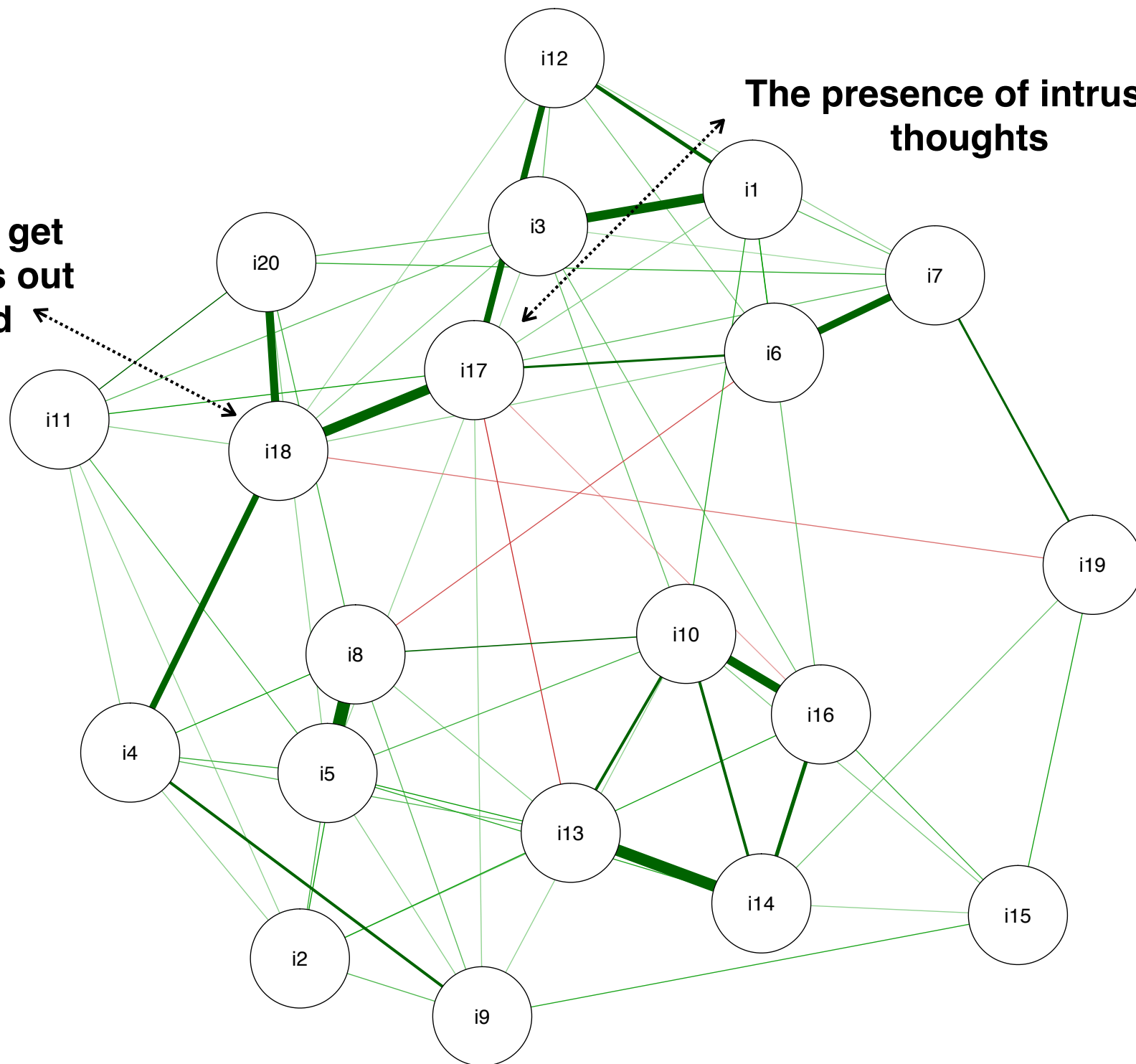
Network structure



**Being unable to get
disappointments out
of one's mind**



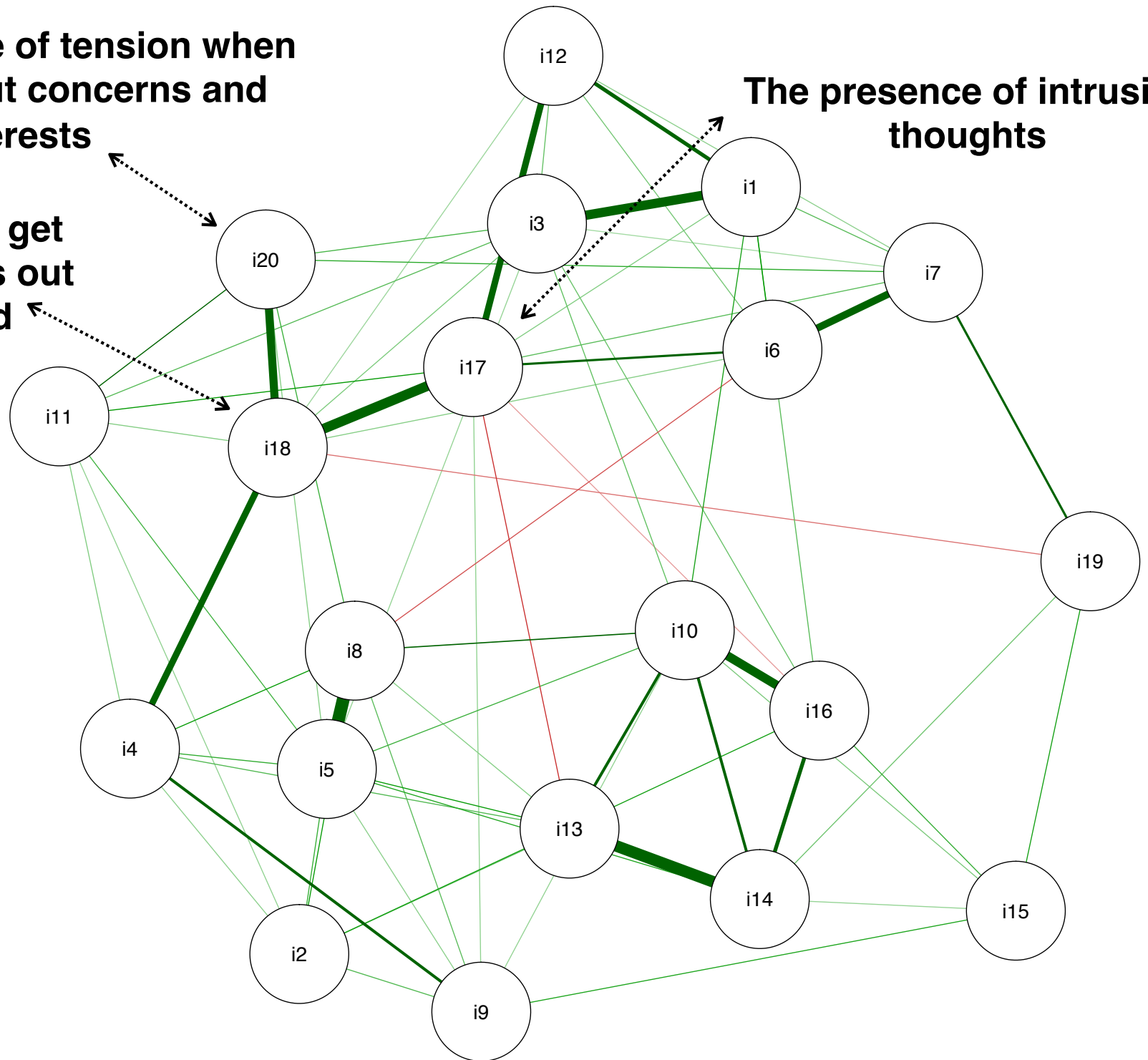
The presence of intrusive thoughts



**Getting in state of tension when
thinking about concerns and
interests**

**Being unable to get
disappointments out
of one's mind**

**The presence of intrusive
thoughts**

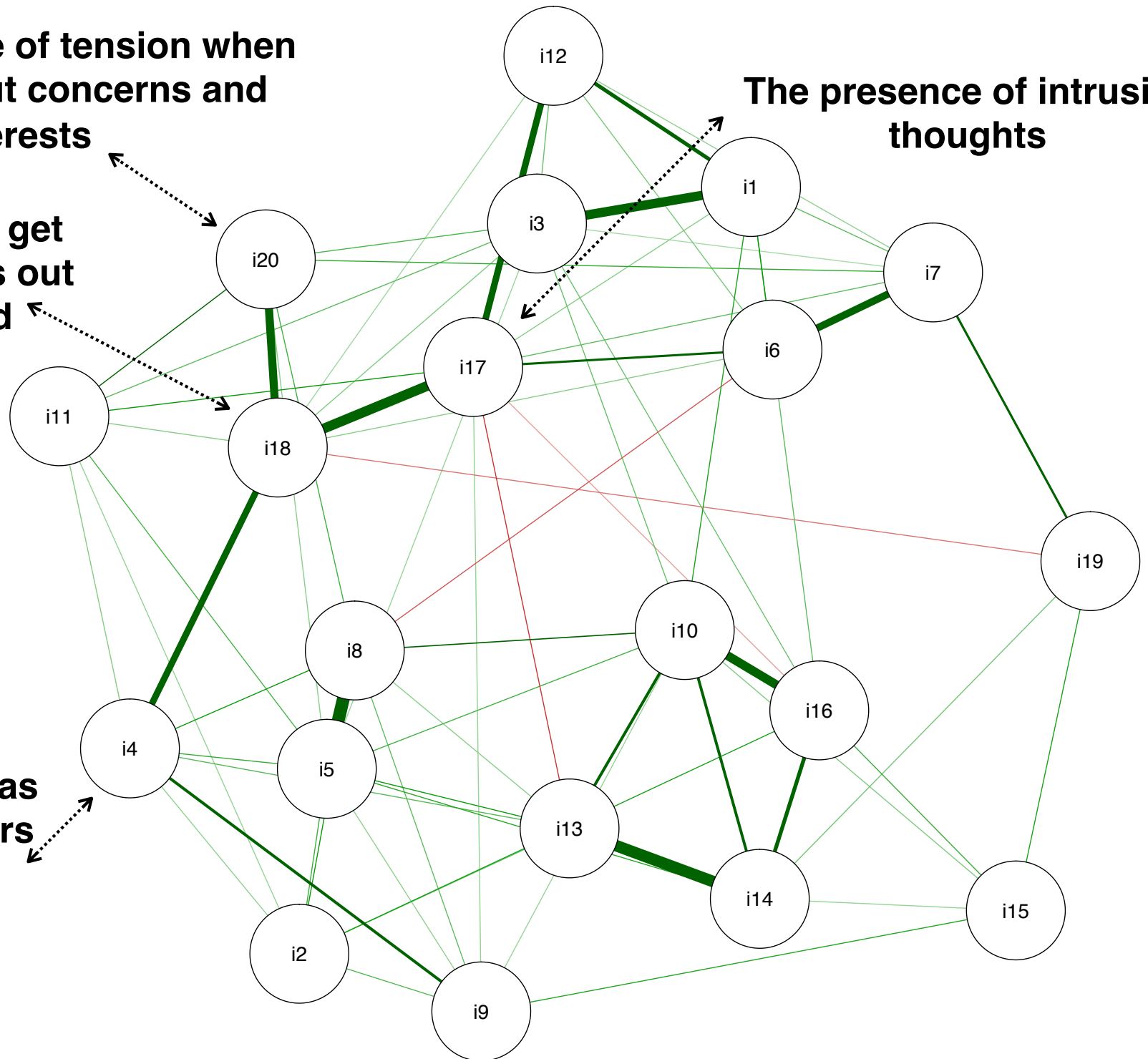


Getting in state of tension when thinking about concerns and interests

The presence of intrusive thoughts

Being unable to get disappointments out of one's mind

Wishing to be as happy as others seem to be (reversed)



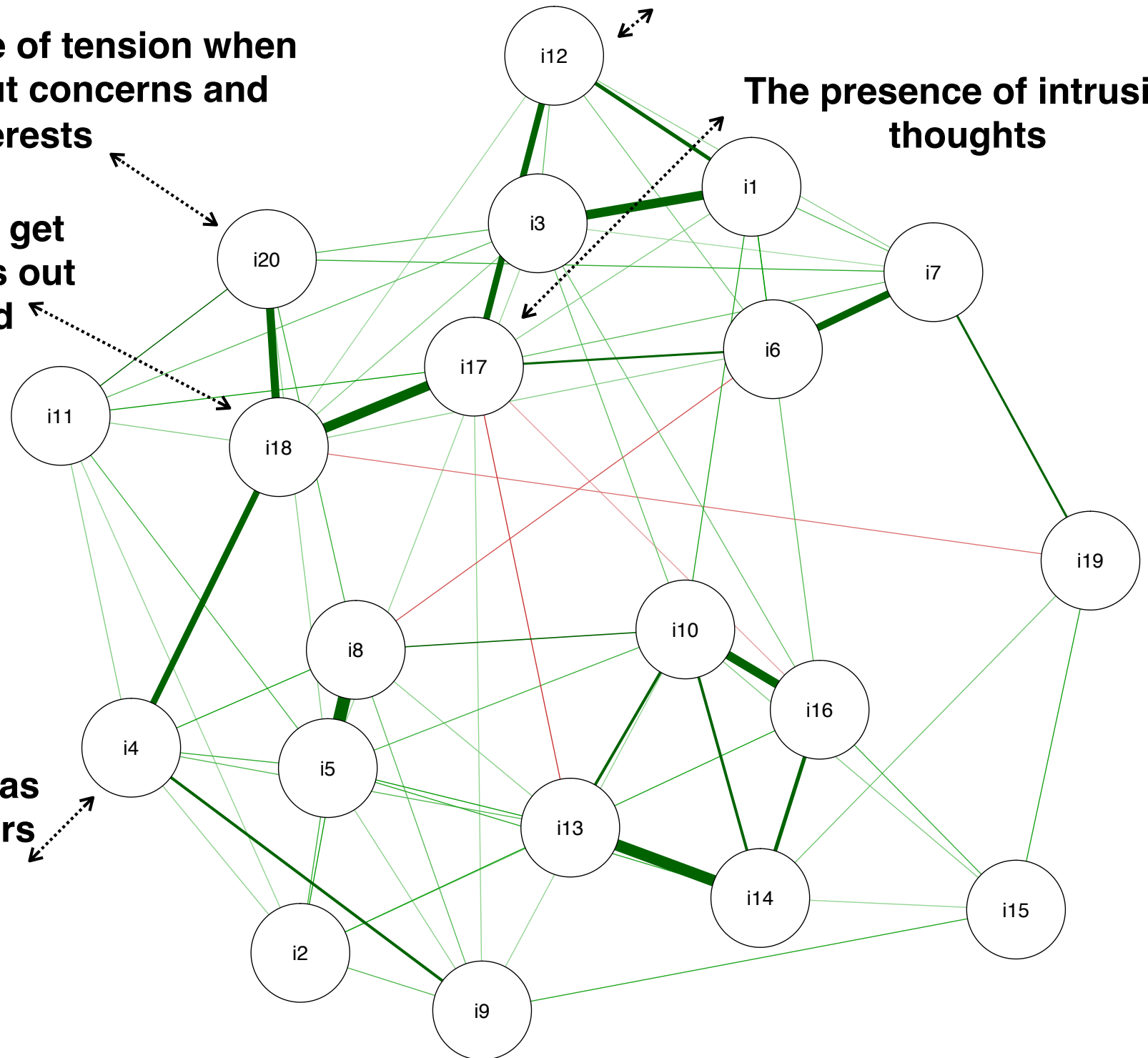
Lack of self-confidence

Getting in state of tension when thinking about concerns and interests

The presence of intrusive thoughts

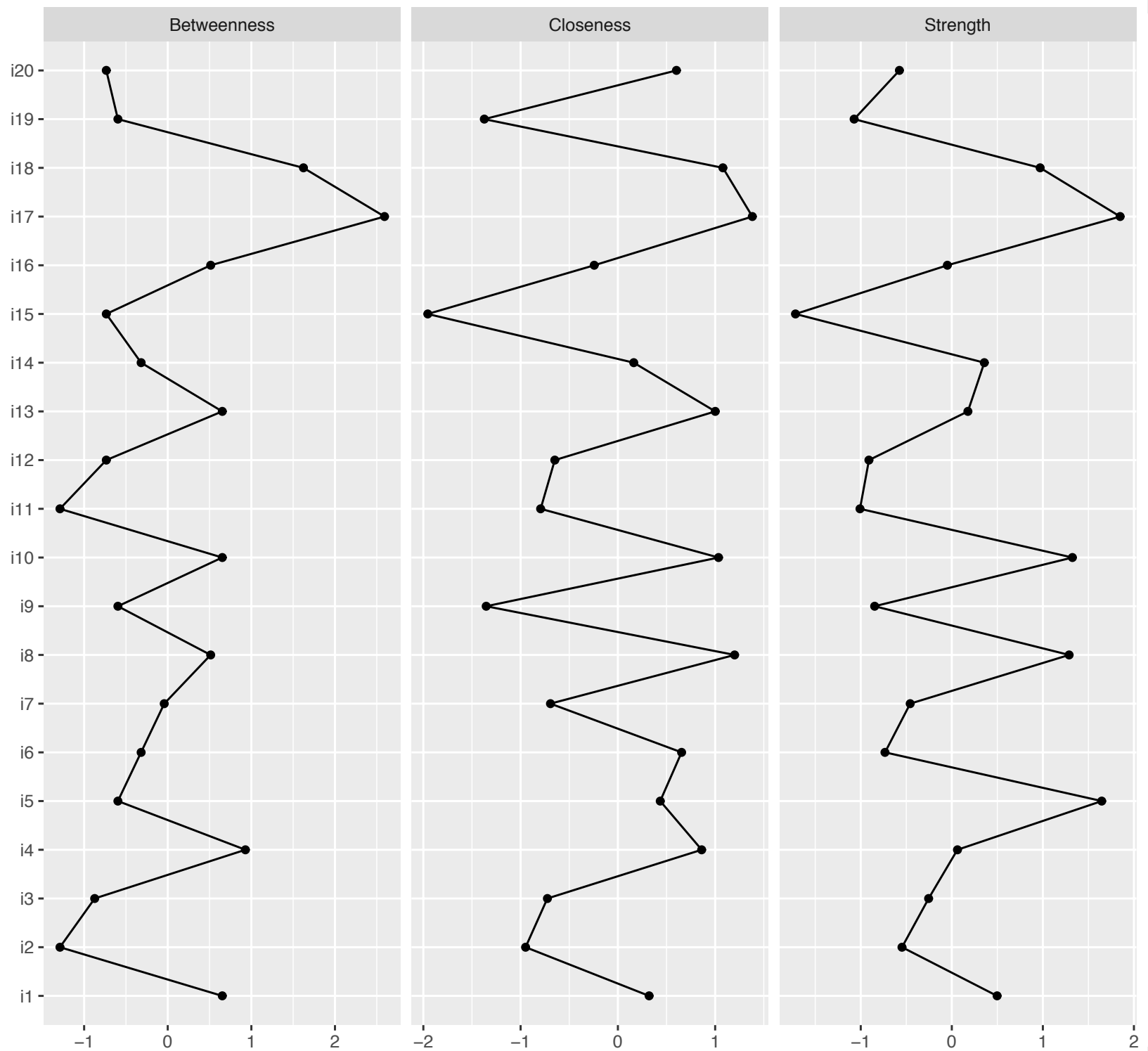
**Being unable to get
disappointments out
of one's mind** ↗

**Wishing to be as
happy as others
seem to be ↗
(reversed)**

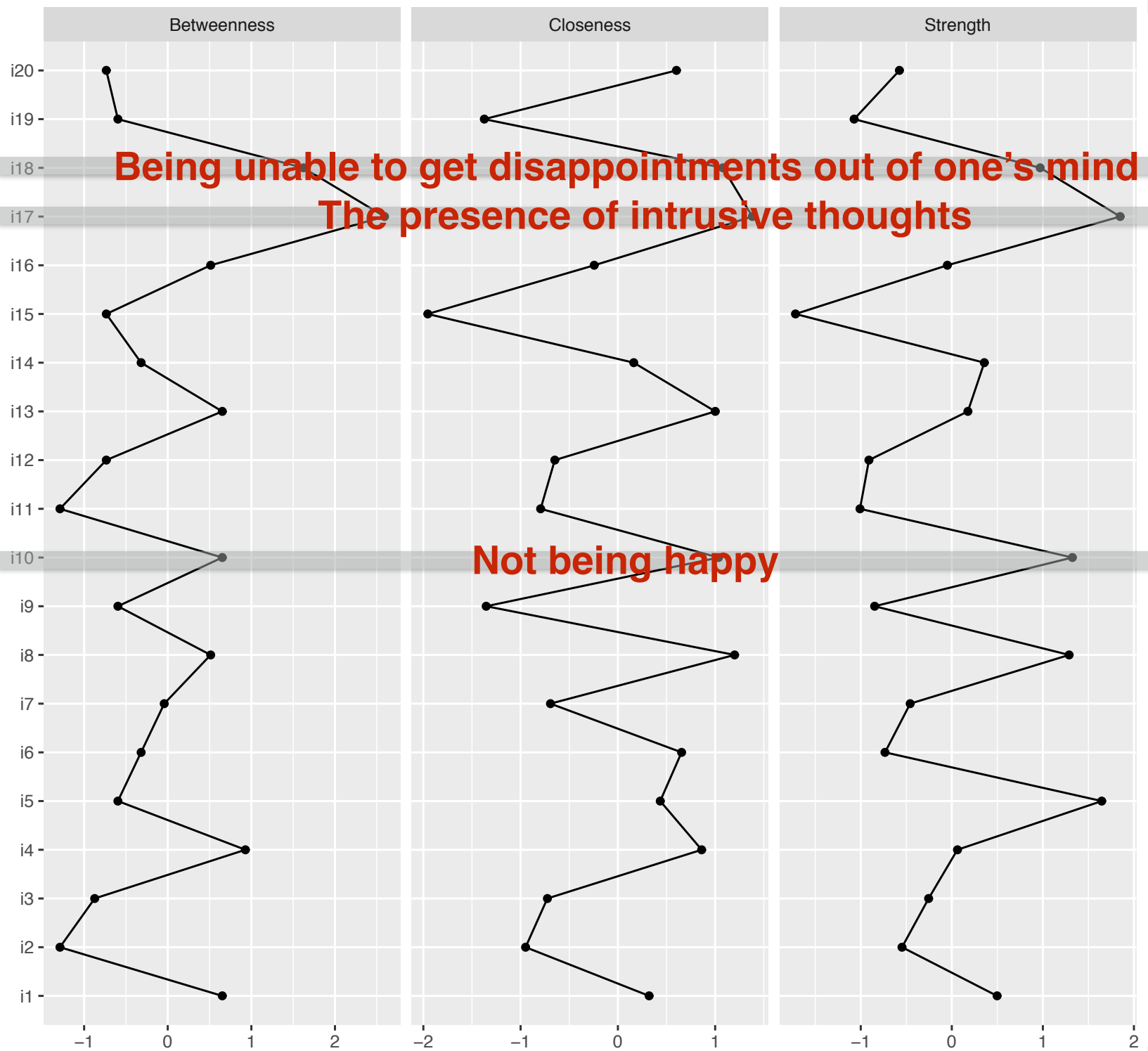


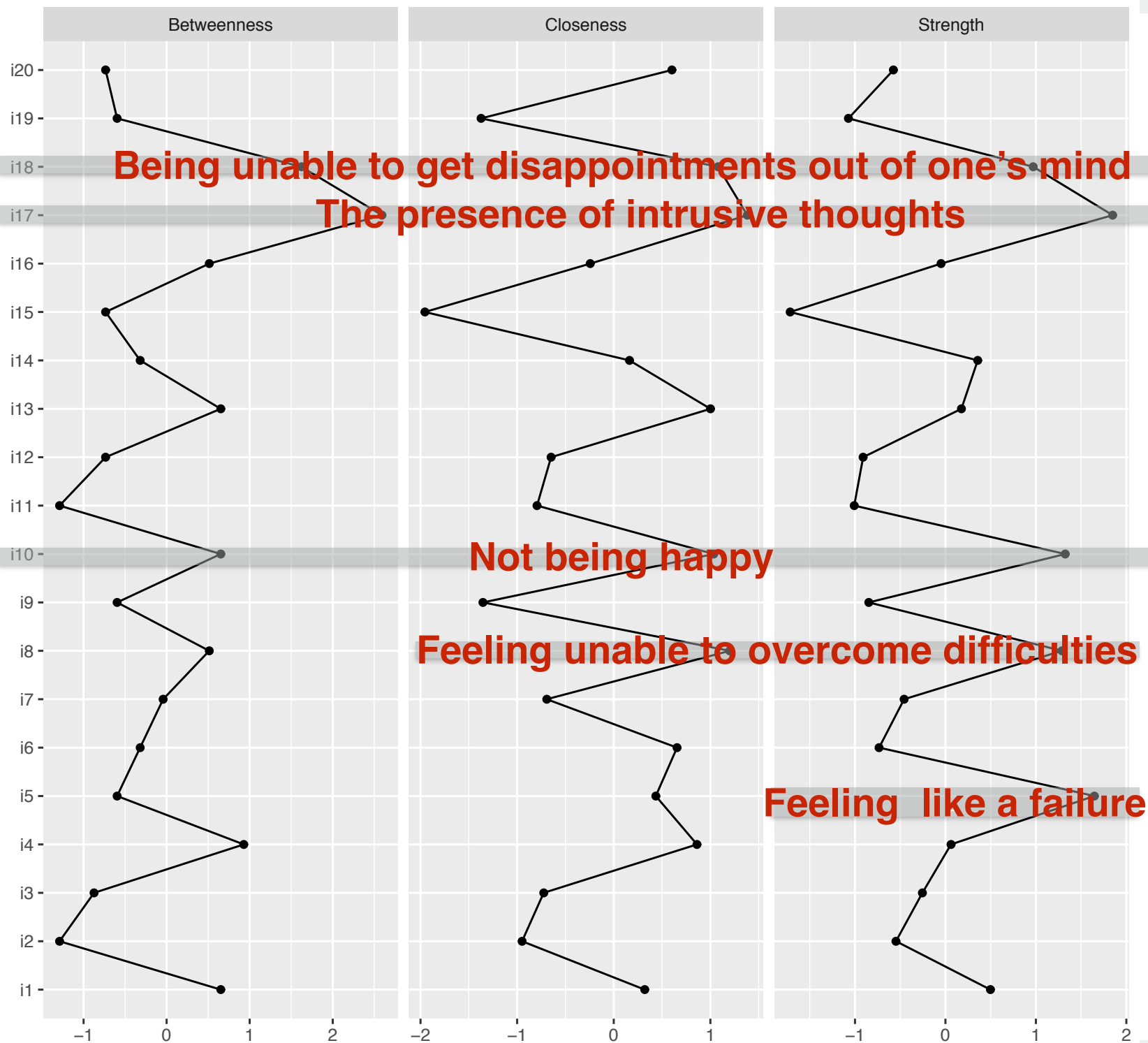
2

Node importance

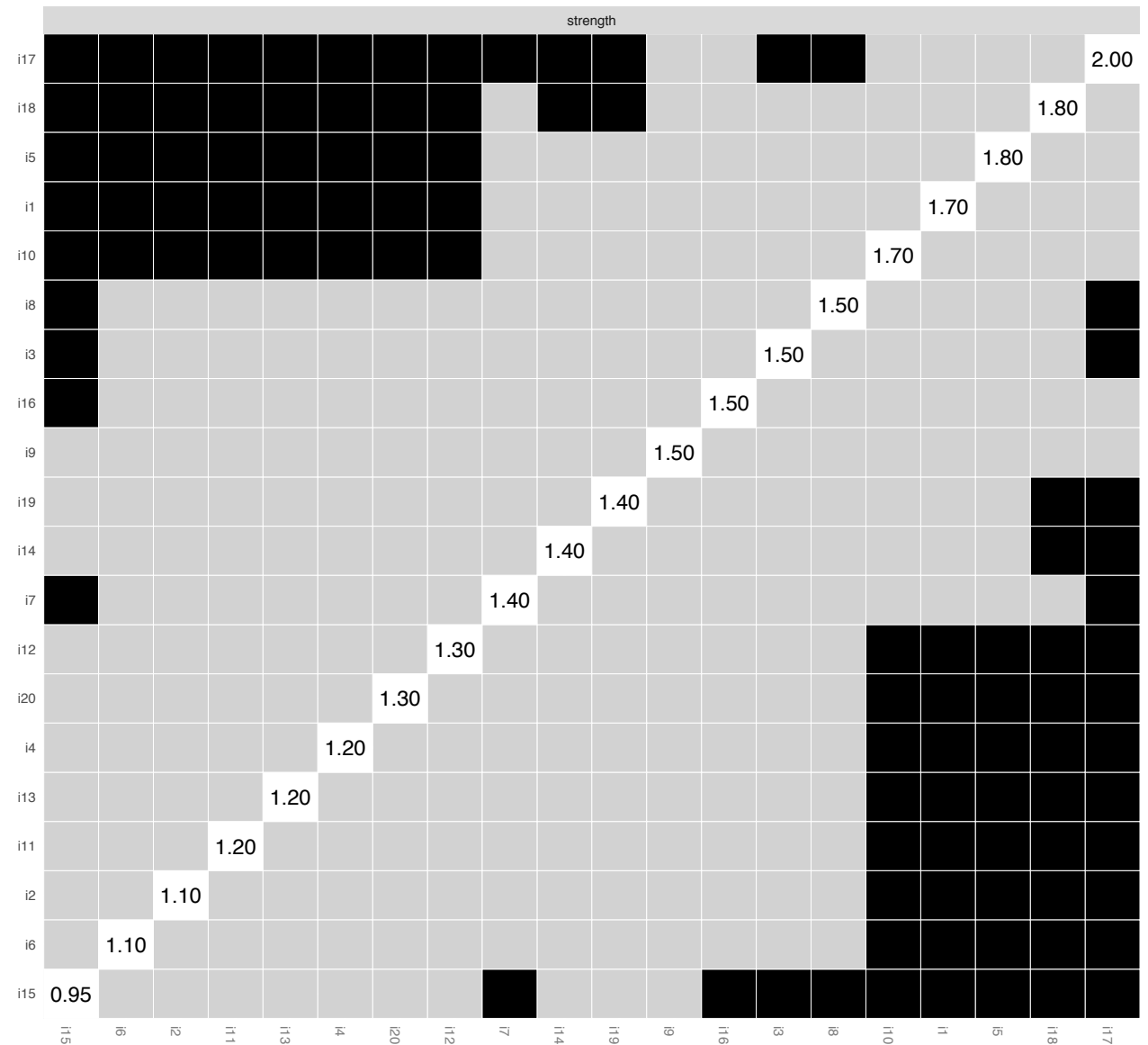








Bootstrapped Difference Test



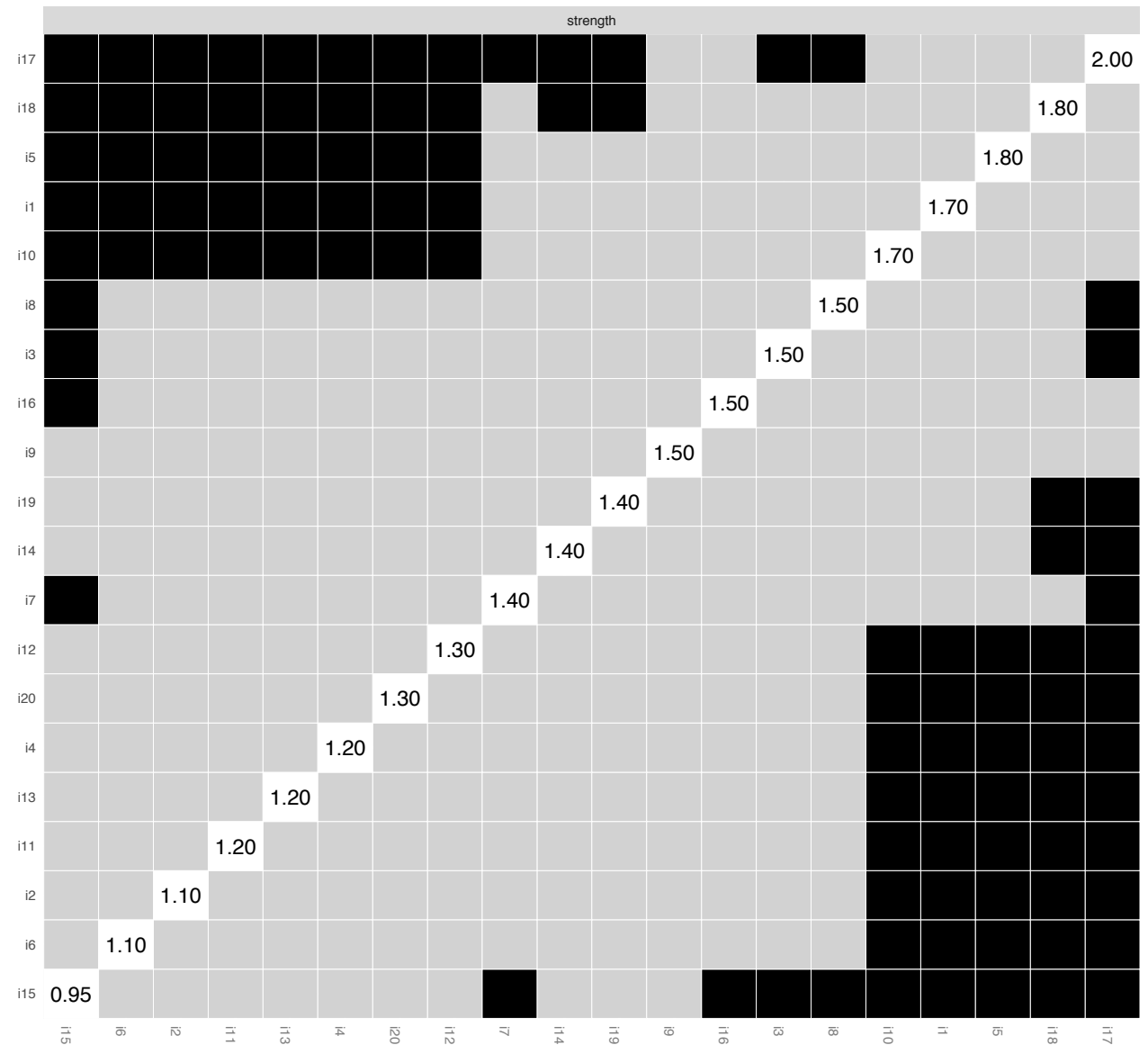
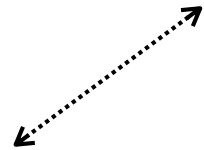
- Person-dropping bootstrap procedure indicated that strength was the most stable centrality index
- **The CS-coefficients were .59 for strength, .37 for betweenness, and .10 for closeness**

Bootstrapped Difference Test

The presence of
intrusive thoughts

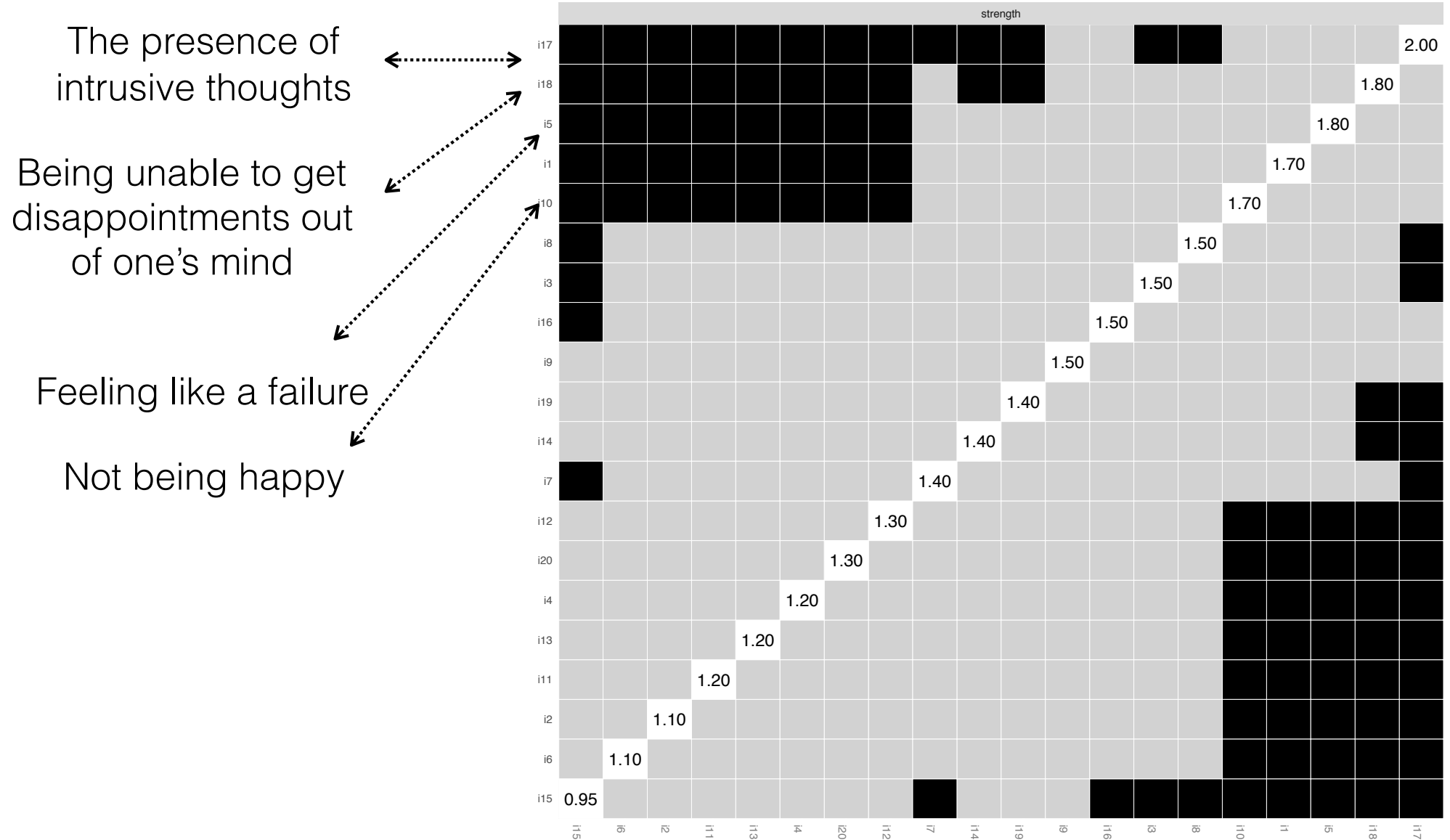


Being unable to get
disappointments out
of one's mind



- Person-dropping bootstrap procedure indicated that strength was the most stable centrality index
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Bootstrapped Difference Test

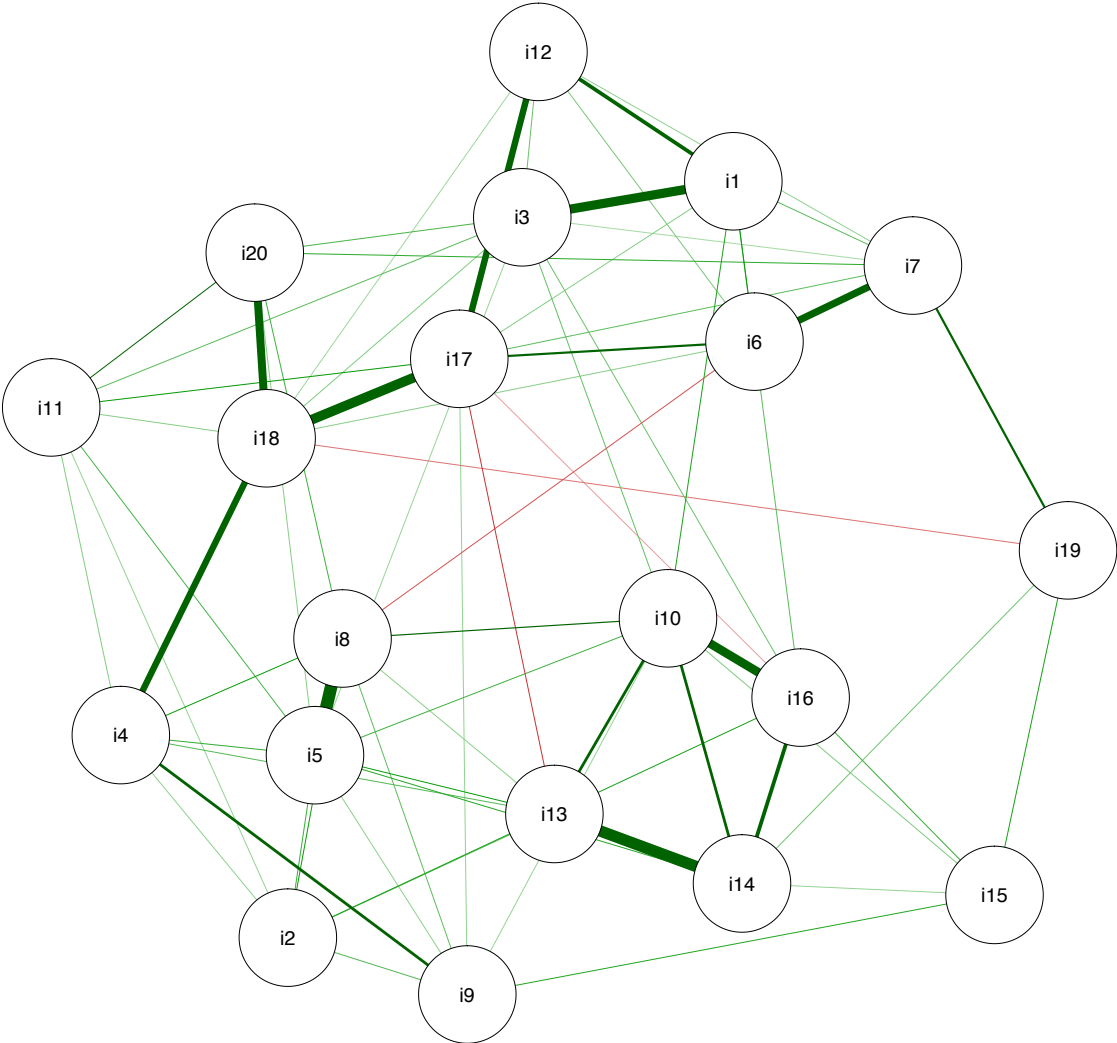


- Person-dropping bootstrap procedure indicated that strength was the most stable centrality index
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3

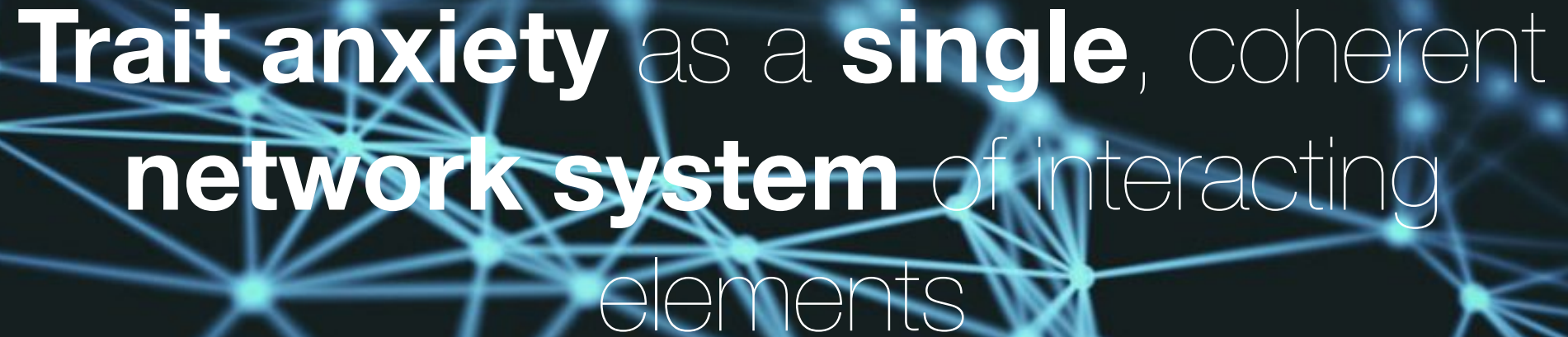
Community structure

Single community structure





Discussion



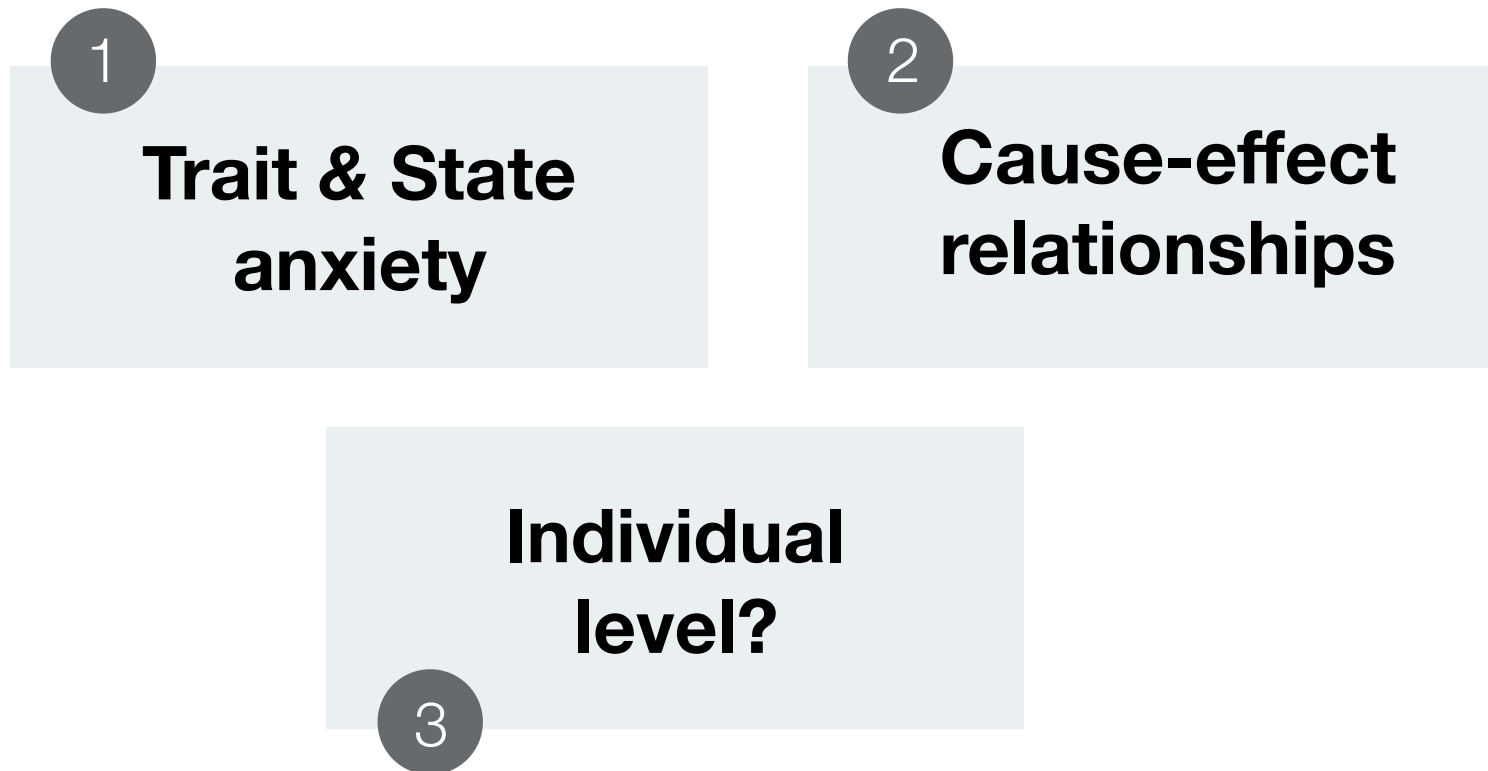
Trait anxiety as a **single**, coherent **network system** of interacting elements

Theoretical implications

- Network theory of personality: Trait anxiety as a **network**
(e.g., Cramer et al., 2012; Möttus & Allerhand, in press)
- Intrusive thoughts and being unable to get disappointments out of one's mind: **central features** of trait anxiety
(e.g., Armstrong & Olatunji, 2012; Clark & Rhyno, 2005; De Raedt & Koster, 2010)

Limitations and future directions

A network approach to trait anxiety:



Want to know more...


Anxiety, Stress, & Coping

ANXIETY, STRESS, & COPING, 2018
VOL. 31, NO. 3, 262–276
<https://doi.org/10.1080/10615806.2018.1439263>

 **Routledge**
Taylor & Francis Group



Deconstructing trait anxiety: a network perspective

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ABSTRACT

Background and objectives: For decades, the dominant paradigm in trait anxiety research has regarded the construct as signifying the underlying cause of the thoughts, feelings, and behaviors that supposedly reflect its presence. Recently, a network theory of personality has appeared. According to this perspective, trait anxiety is a formative construct emerging from interactions among its constitutive features (e.g., thought, feelings, behaviors); it is not a latent cause of these features.

Design: In this study, we characterized trait anxiety as a network system of interacting elements.

Methods: To do so, we estimated a graphical gaussian model via the computation of a regularized partial correlation network in an unselected sample ($N=611$). We also implemented modularity-based community detection analysis to test whether the features of trait anxiety cohere as a single network system.

Results: We find that trait anxiety can indeed be conceptualized as a single, coherent network system of interacting elements.

Conclusions: This radically new approach to visualizing trait anxiety may offer an especially informative view of the interplay between its constitutive features. As prior research has implicated trait anxiety as a risk factor for the development of anxiety-related psychopathology, our findings also set the scene for novel research directions.

ARTICLE HISTORY

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KEYWORDS

Trait anxiety; network analysis; graph theory; graphical gaussian model; anxiety; network theory of personality

No conflict of interest to declare.

A network diagram with glowing blue nodes and connecting lines on a dark background. The nodes are small, bright blue circles, and the lines are thin, glowing blue lines that connect the nodes in a complex, web-like pattern. The overall effect is a sense of interconnectedness and digital communication.

Declaration of interest



Emily E. Bernstein

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A background image for the Acknowledgements section featuring a complex network of glowing blue nodes connected by lines, set against a dark background.

Acknowledgements



Feel inspired




My funders

Thank you for your attention

contact: alexandre.heeren@uclouvain.be

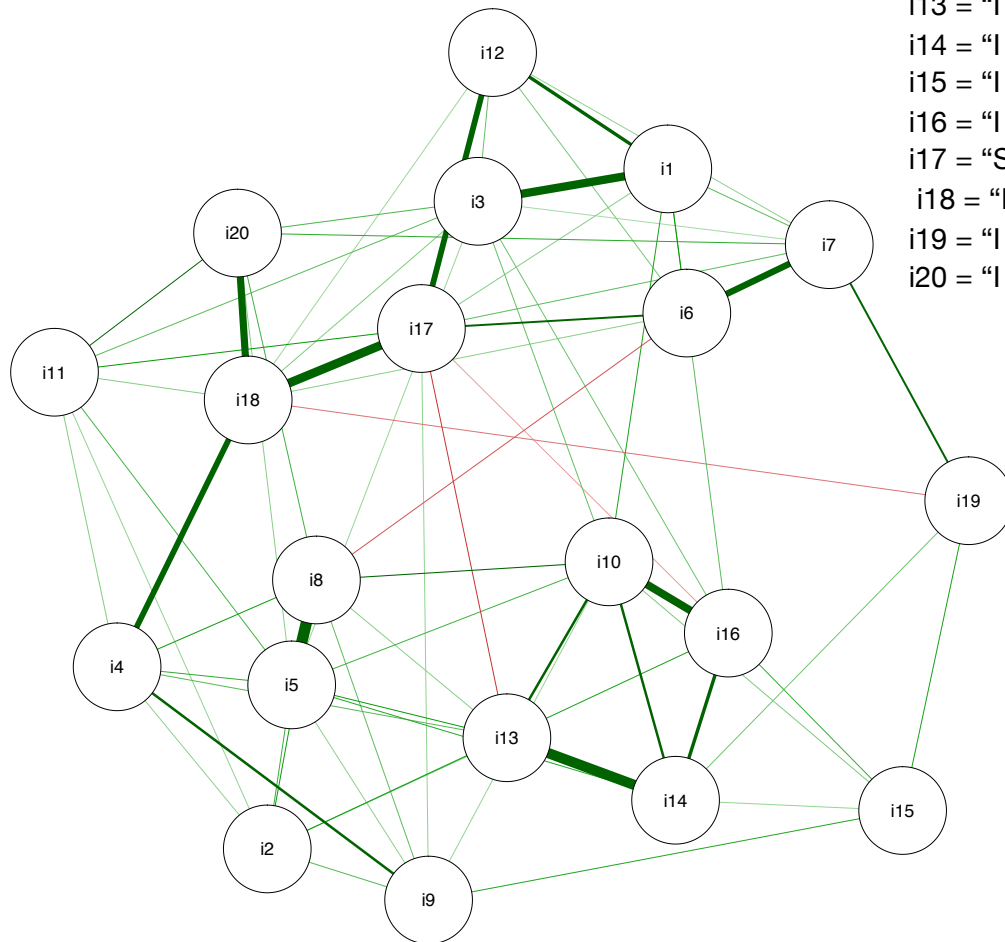




***No doors should be closed in the
study of personality***

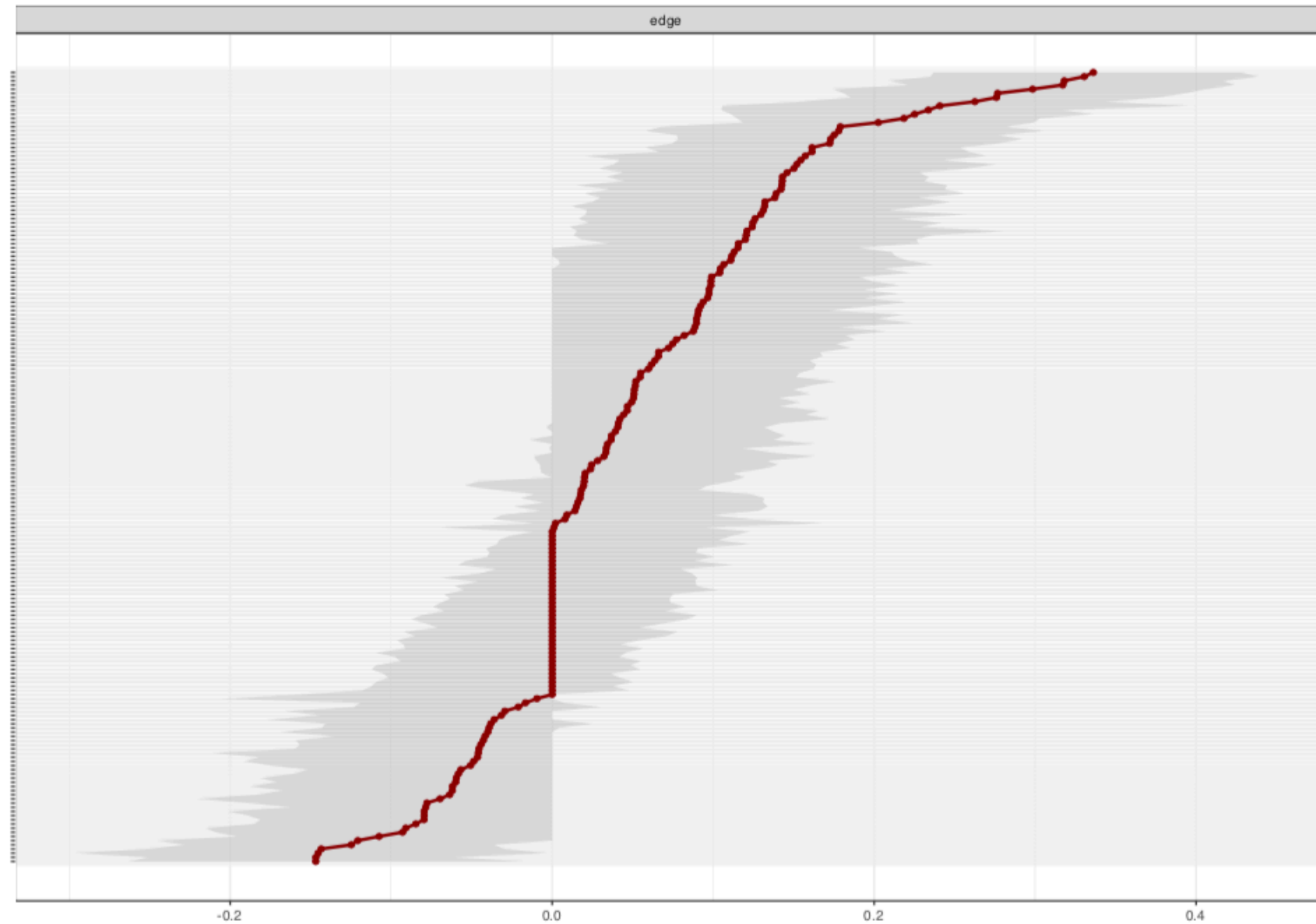
Allport (1946)

Supplementary materials



- 1 = "I feel pleasant" (reverse scored);
- i2 = "I feel nervous and restless";
- i3 = "I feel satisfied with myself" (reverse scored);
- i4 = "I wish I could be as happy as other seems to be";
- i5 = "I feel like a failure";
- i6 = "I feel rested" (reverse scored);
- i7 = "I am calm, cool, and collected" (reverse scored);
- i8 = "I feel that difficulties are piling up so that I cannot overcome them";
- i9="I worry too much over something that really doesn't matter";
- i10="I am happy" (reverse scored);
- i11 = "I have disturbing thoughts";
- i12 = "I lack self-confidence";
- i13 = "I feel secure" (reverse scored);
- i14 = "I make decisions easily" (reverse scored);
- i15 = "I feel inadequate";
- i16 = "I am content" (reverse scored);
- i17 = "Some unimportant thoughts runs through my mind and bothers me";
- i18 = "I take disappointments so keenly that I can't put them out of my mind";
- i19 = "I am a steady person" (reverse scored),
- i20 = "I get in a state of tension or turmoil as I think over my recent concerns and interests".

Accuracy of the edge weights: Non-parametric bootstrap



State-Trait Anxiety Inventory (STAI)

State form (STAI-S)

Charles D. Spielberger



- 20-item instrument (e.g., *I am tense*; *I am upset*) in reference to how participants are feeling at the moment
- 4-point scale ranging from 1 (“not at all”) to 4 (“very much so”).

Trait form (STAI-T)

- 20-item instrument (e.g., *I worry too much*; *I feel nervous*) in reference to how participants generally feel
- 4-point scale ranging from 1 (“almost never”) to 4 (“almost always”).

(e.g., Spielberger, Gorsuch, Vagg, & Jacobs, 1983)