

More than the Sum of Its Parts: Using Personality Networks to Predict Outcomes

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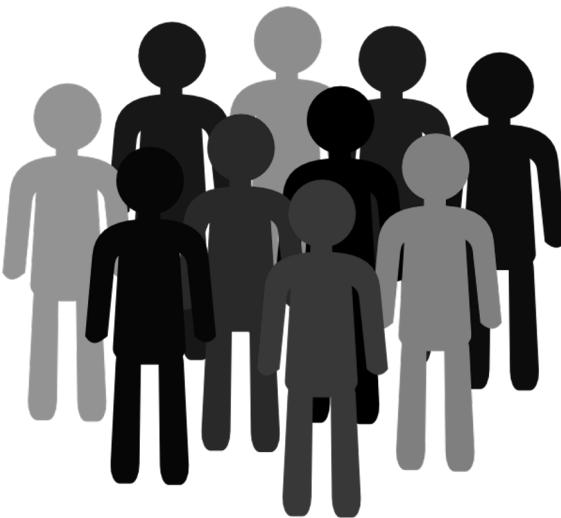
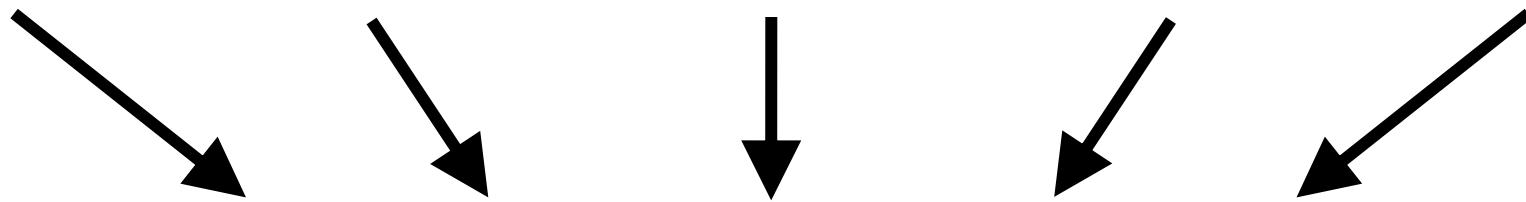
Extraversion

Agreeableness

Conscientiousness

Neuroticism

Openness



Nomothetic

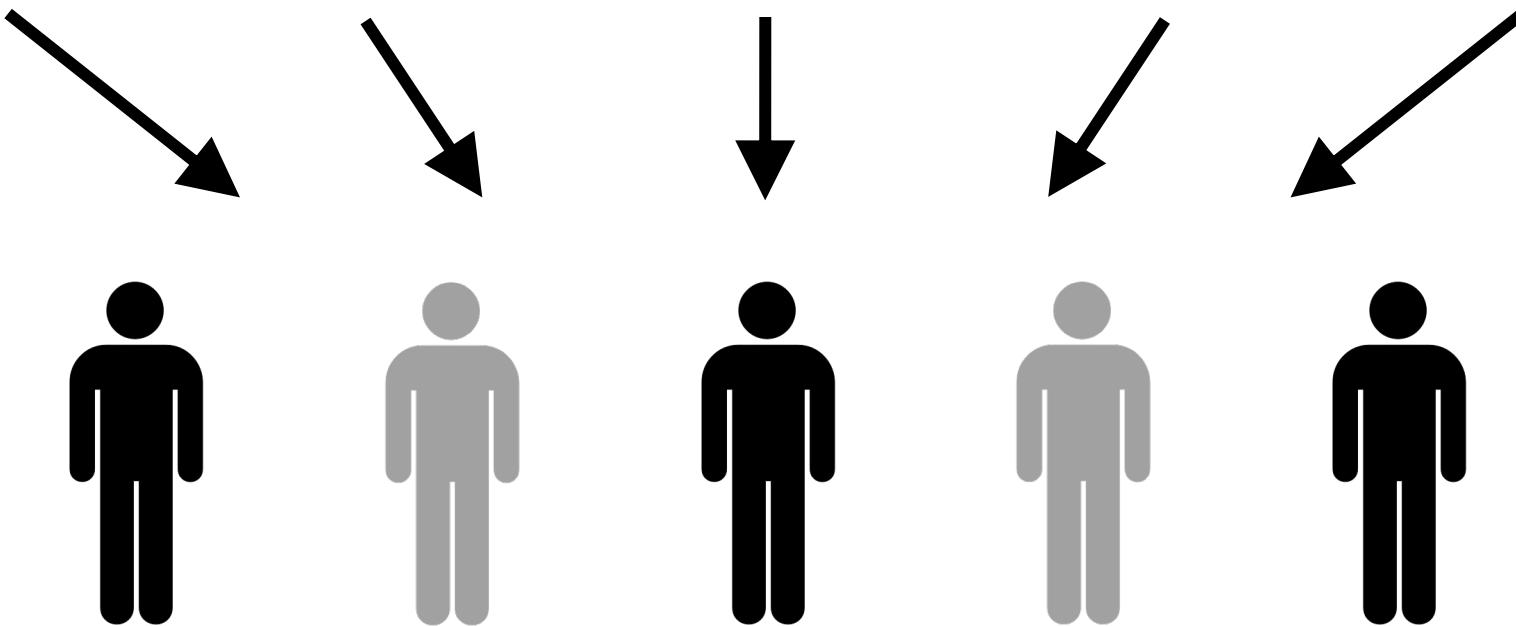
Extraversion

Agreeableness

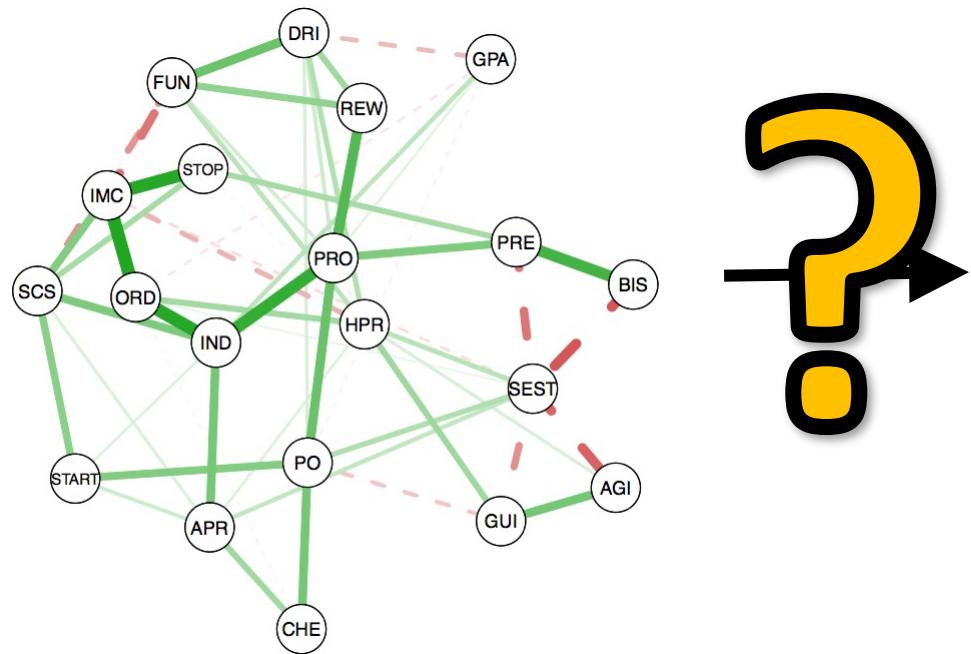
Conscientiousness

Neuroticism

Openness

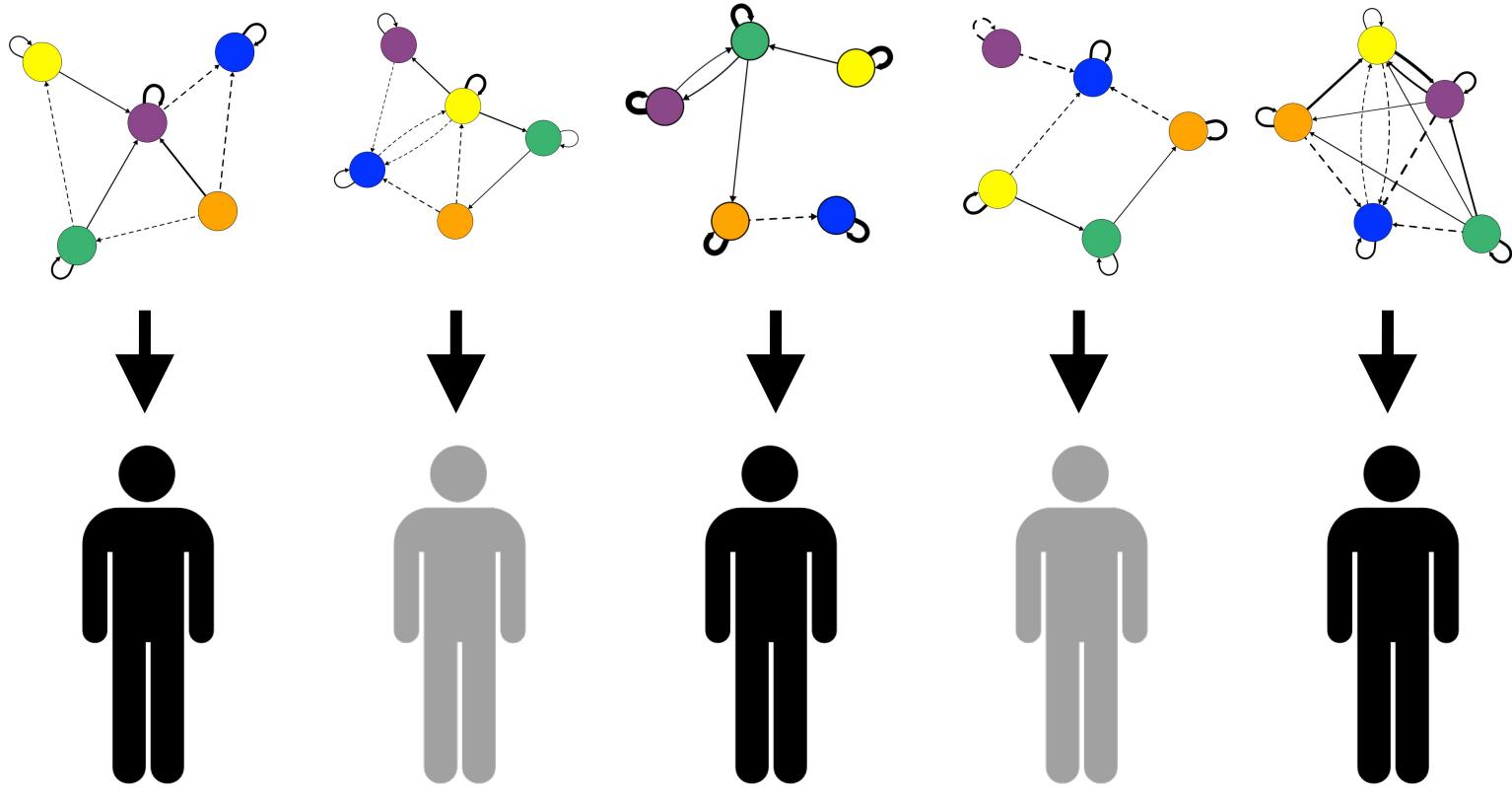


Idiographic



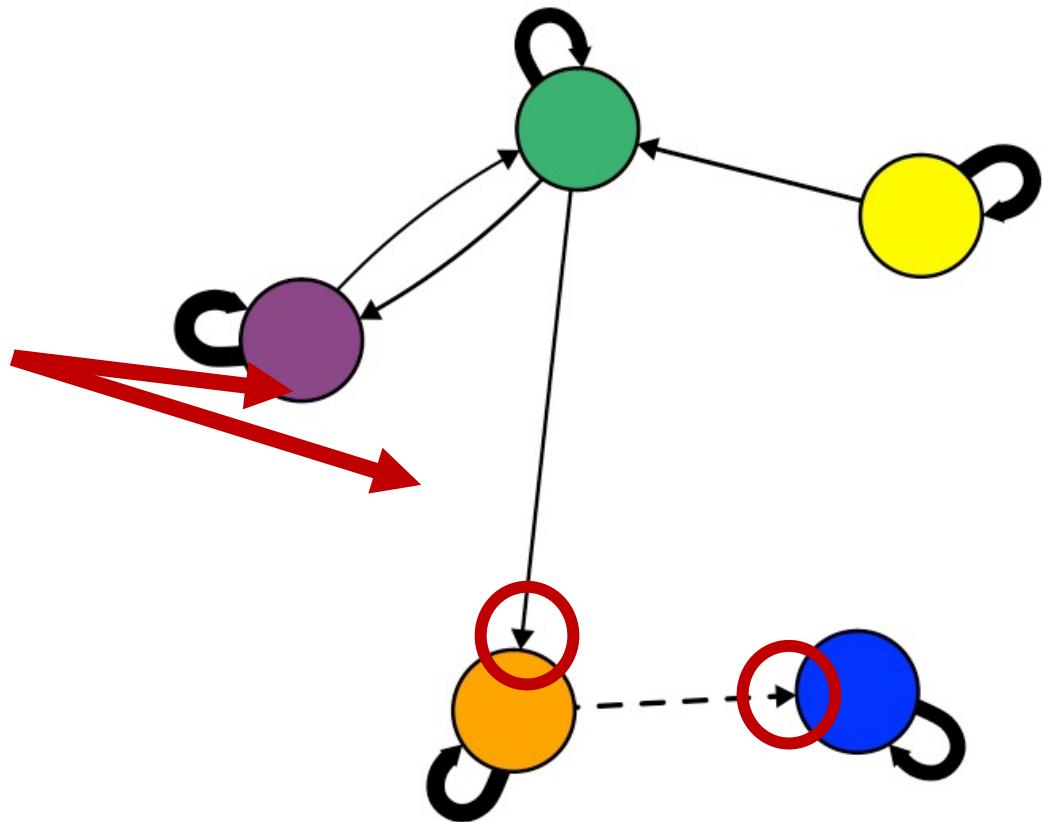
GPA

Figure from Constantini & Peregini, 2016

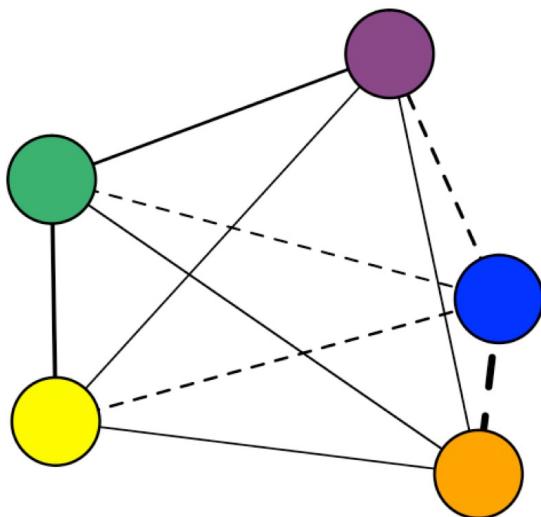


Idiographic

Nodes
Edges
Weighted
Signed
Directed

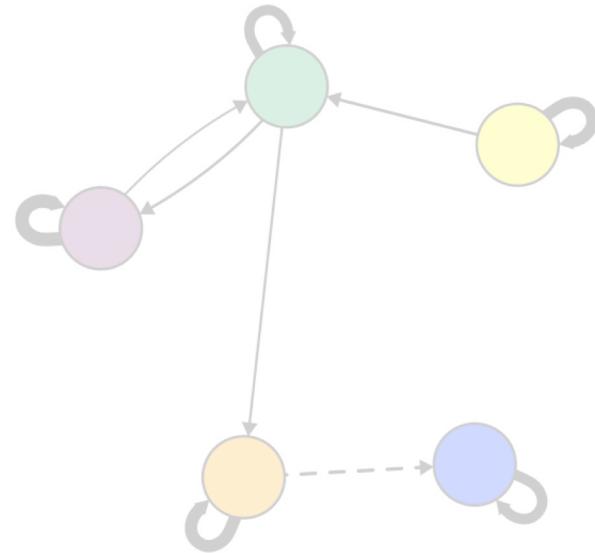


Concurrent behaviors: *While...*



Within Time-Points: $X_i \leftrightarrow Y_i$

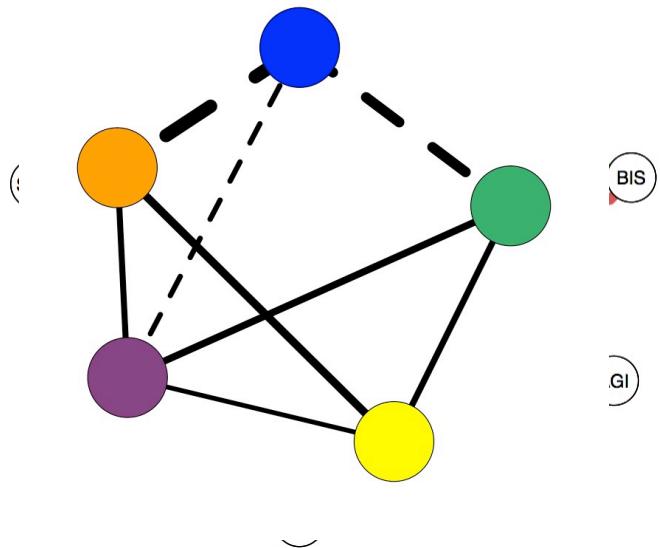
Contingent behaviors: *If... Then...*



Between-Time Points: $X_i \rightarrow Y_{i+1}$

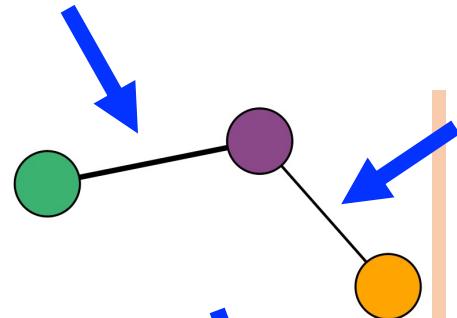
Conscientiousness

Ideographic

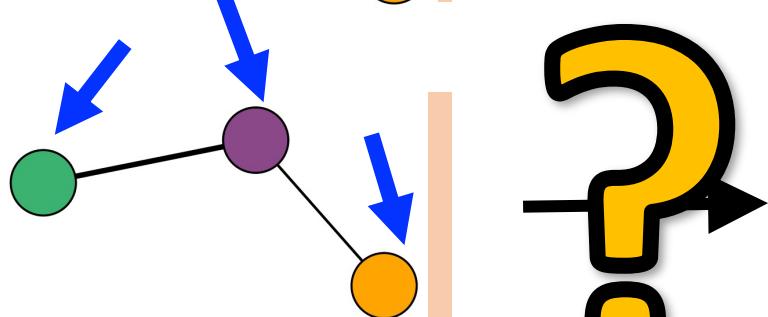


GPA

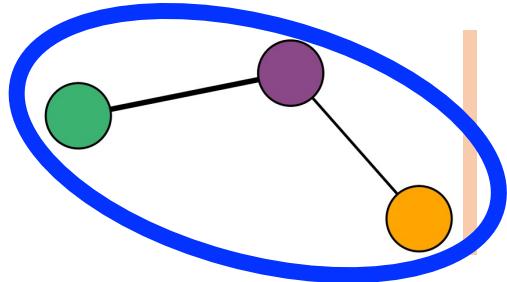
**Edge
Level**



Node Level



Network Level



GPA

**Edge
Level**

Edge Weights
Shortest Path Lengths

**Node
Level**

Centrality
Local Clustering Coef
Local Activation

**Network
Level**

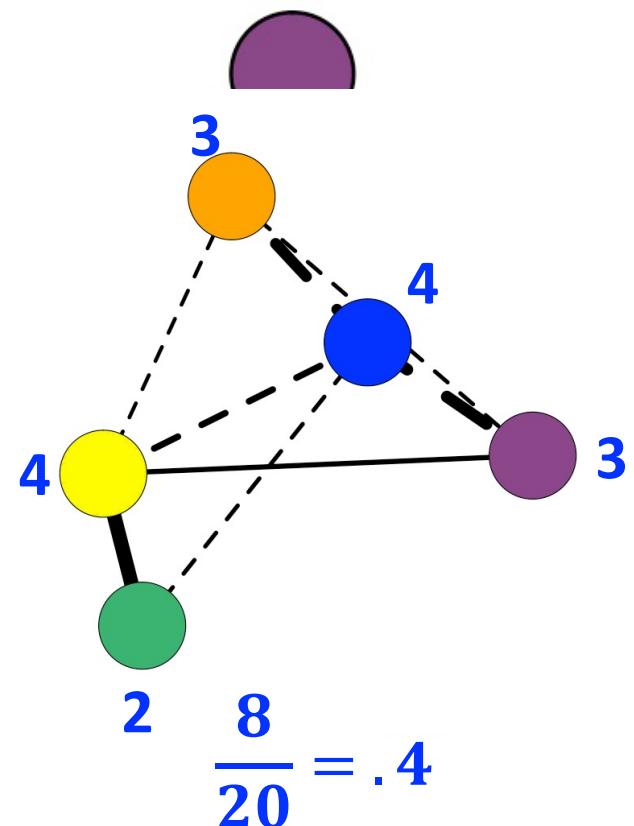
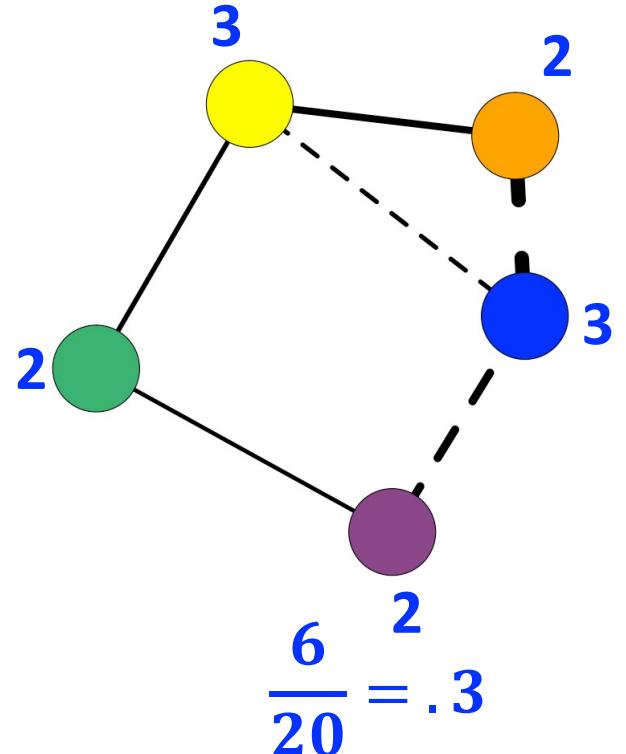
Density
Global Clustering Coef
Global Activation



GPA

Nodes
Edges
Weighted
Signed
Directed
Centrality
Degree
Density

$$\frac{\text{Actual connections}}{\text{Possible Connections}}$$



Conscientiousness

Node Level: Degree
Centrality

Network Level:
Density

Neuroticism

The Present Study



GPA

The Present Study

Conscientiousness

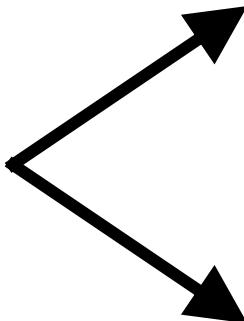
Node Level: Degree
Centrality

Network Level:
Density

Neuroticism

Life Satisfaction

GPA



Methods

1 years of ESM responses from the Personality and Interpersonal Roles Study (PAIRS)

N = 372 Wash U undergrads, total ESM assessments

N = 11,065 (median # of responses: 31)

N1: Relaxed
N2: Depressed
N3: Worried
E1: Quiet
E2: Outgoing
A1: Rude
A2: Kind
C1: Lazy
C2: Reliable

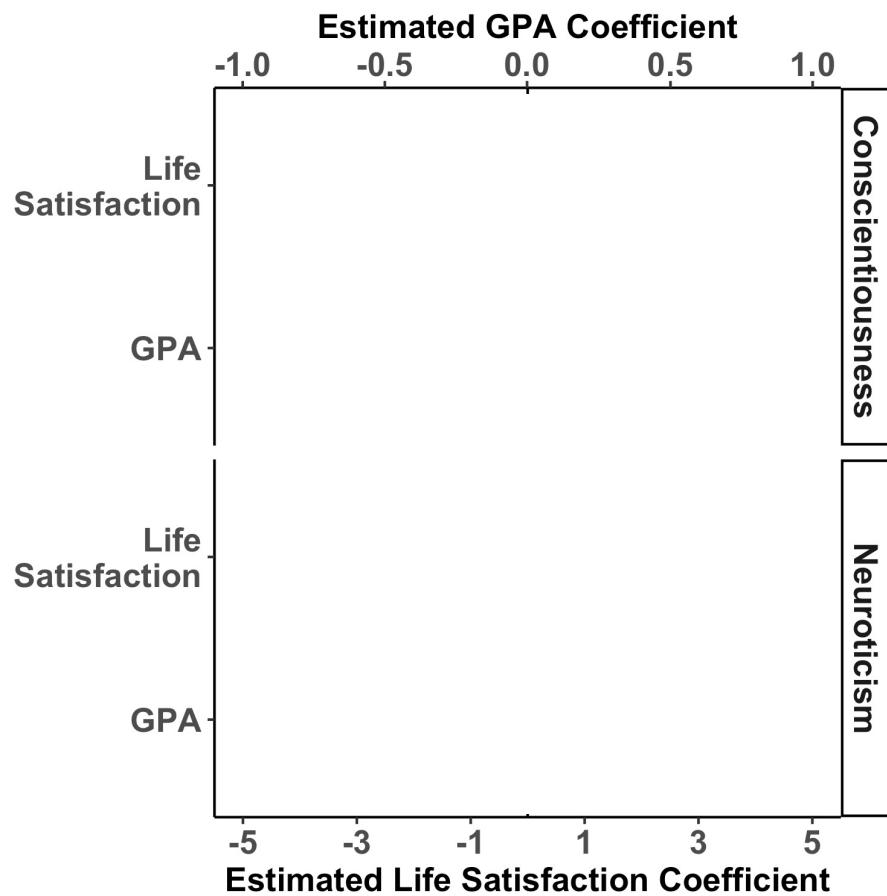
Measures

9 items from the Big Five Inventory (BFI)

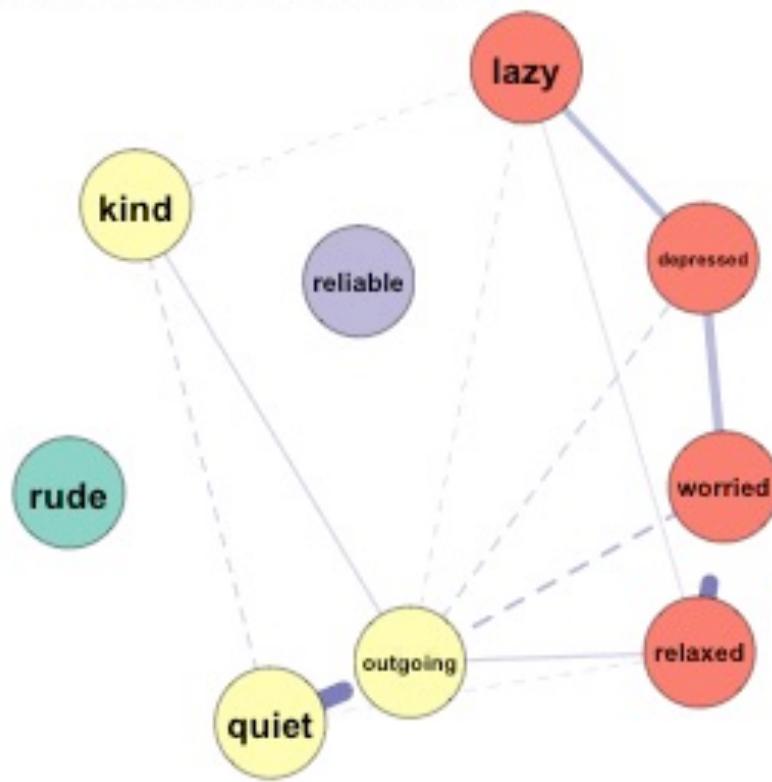
Procedure

4 assessments / day for 15 days

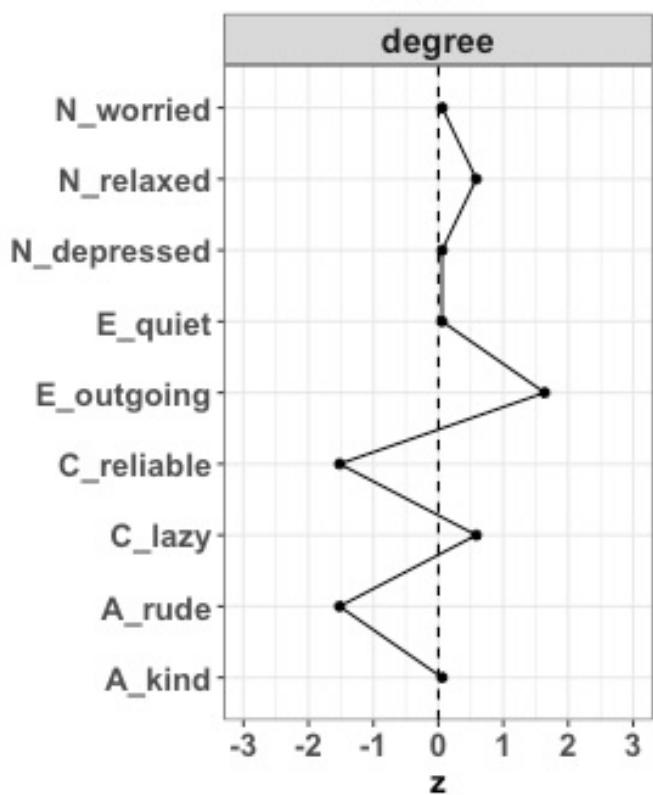
Results



Contemporaneous Wave 1 for S1



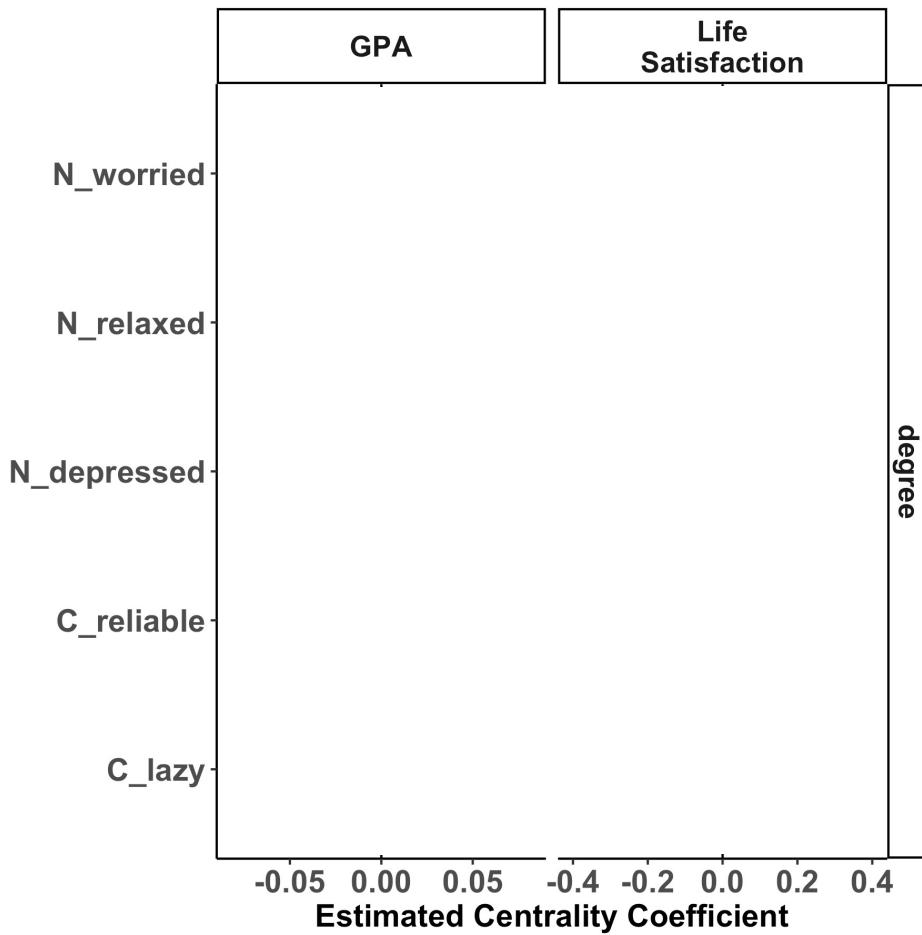
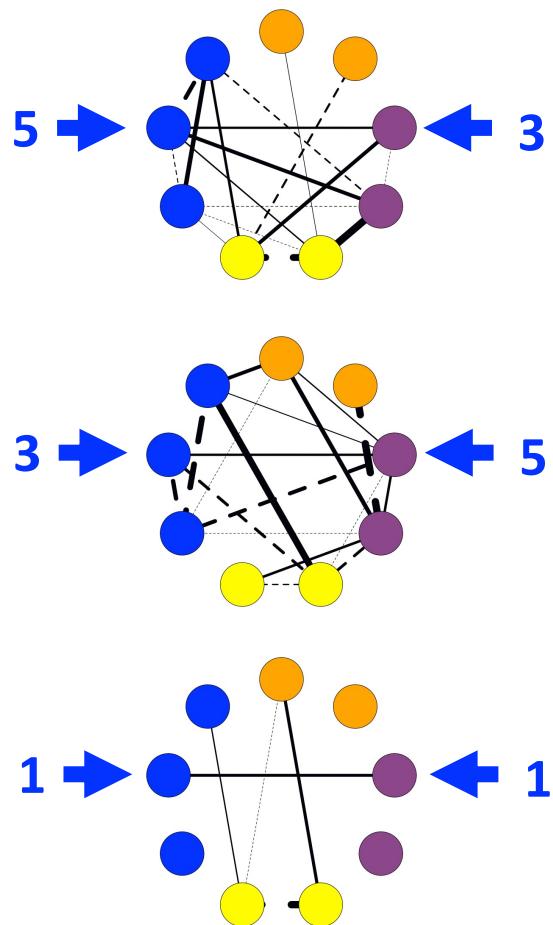
Subject 1



Composites

Centrality

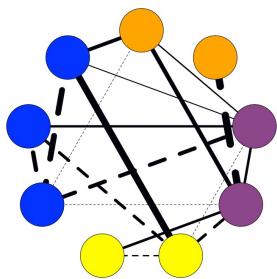
Density



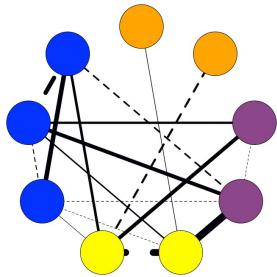
Composites

Centrality

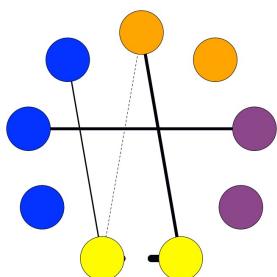
Density



.4
8

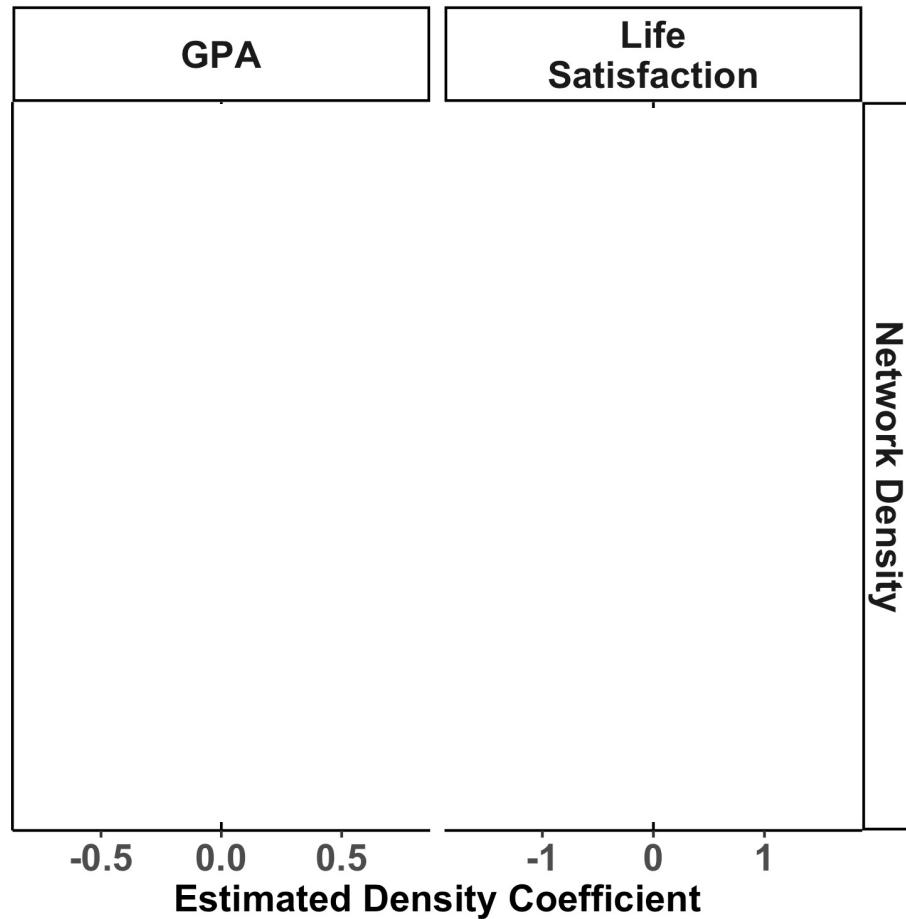


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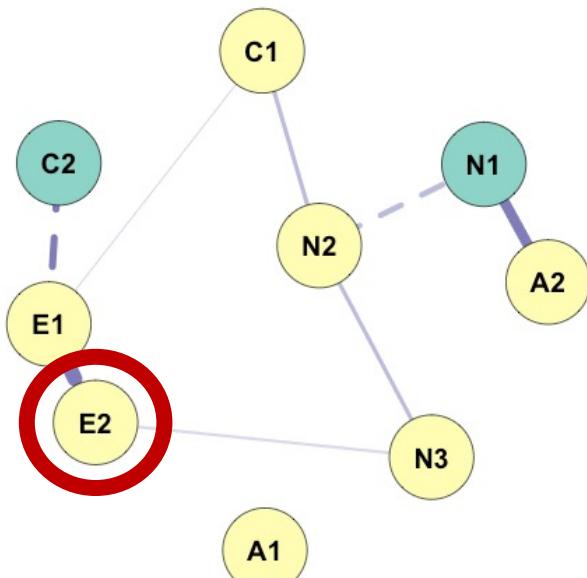
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Actual connections
—————
Possible Connections



Low Density, Degree

Contemporaneous Wave 1 for S62



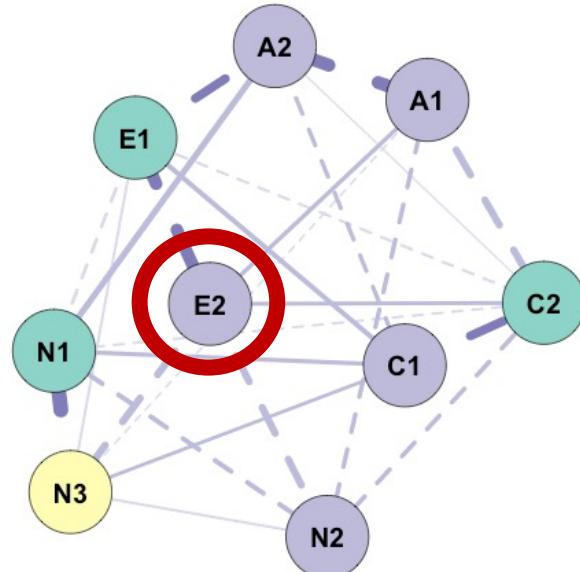
RIGIDITY



CHAOS

High Density, Degree

Contemporaneous Wave 1 for S95



Summary and Conclusions

We can now **fit idiographic personality networks**

The present results represent a subset of results but
there are many more network properties

In this sample, many other network properties were
not associated with outcomes

Unclear whether null results represent **lack of
predictive power or measurement issues**

Broad, coarse measures have **some predictive
power, above and beyond Big 5 ESM composites**

Questions?

Special Thanks to:

Josh Jackson

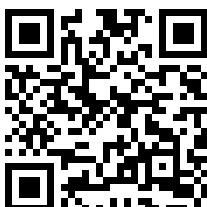
The PMaD Lab

(And the people who
brought us PAIRS data)



R Code Available at:

https://emoriebeck.github.io/PAIRS_outcomes/



Interactive Idiographic Plots Available at:

https://emoriebeck.shinyapps.io/PAIRS_outcomes/

Selected References

R Packages:

qgraph

igraph

graphicalVAR

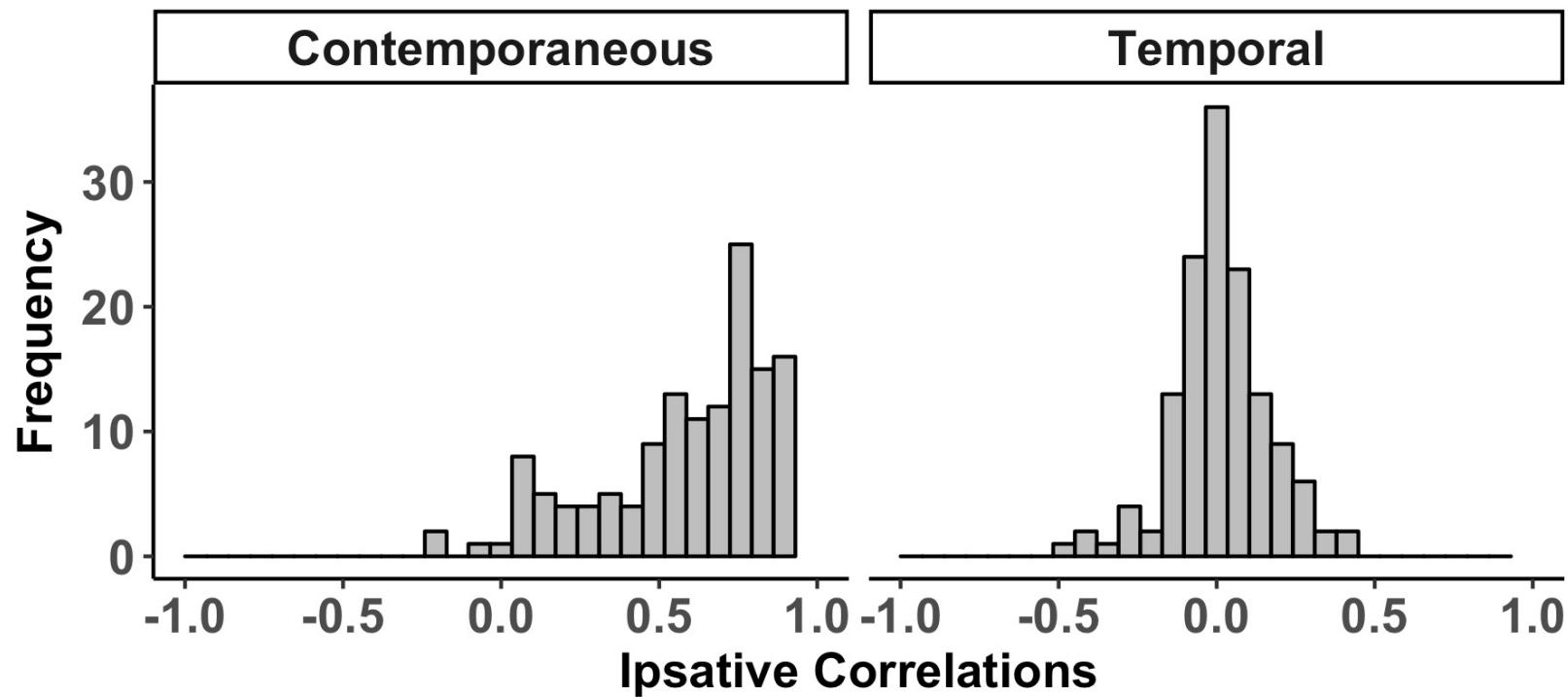
dplyr

tidyR

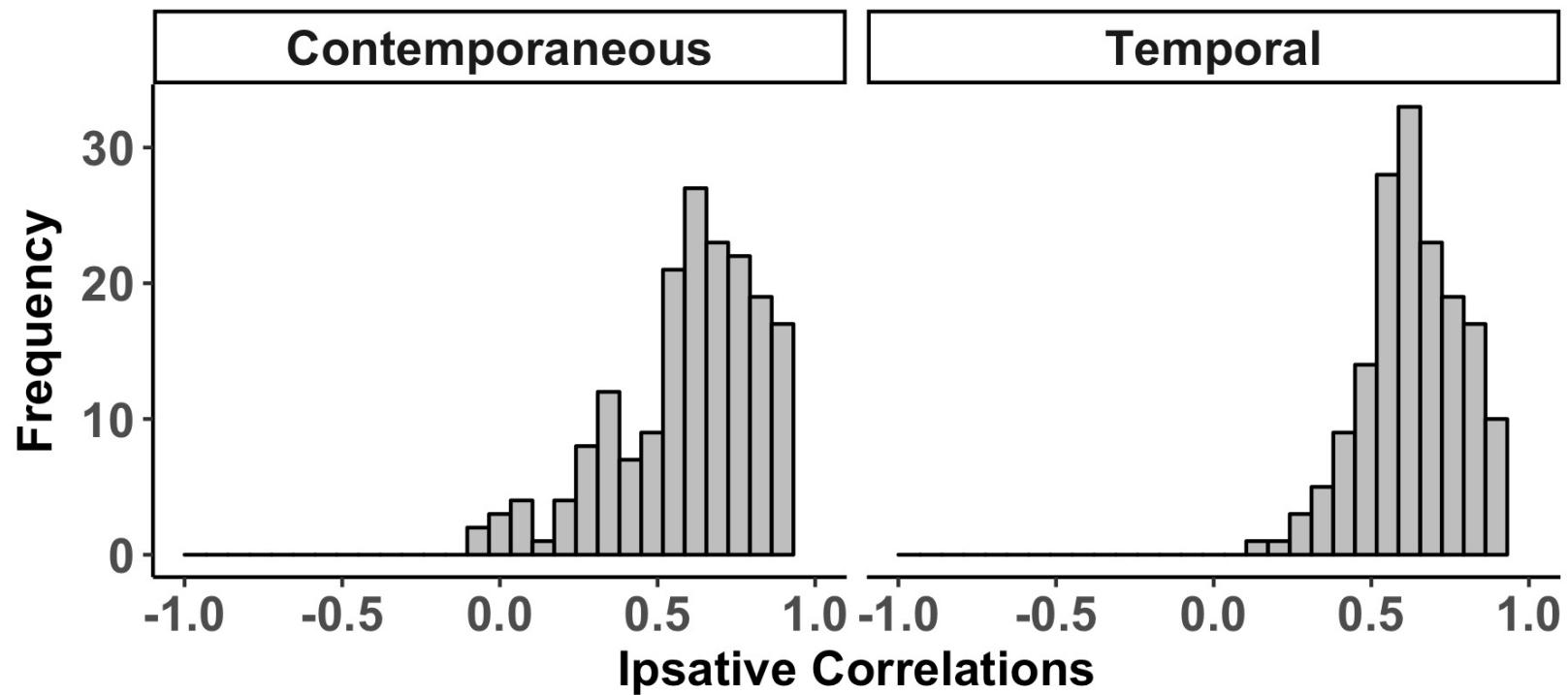
purrr (for many, many
idiographic models)

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- Schmittmann, V. D., Cramer, A. O., Waldorp, L. J., Epskamp, S., Kievit, R. A., & Borsboom, D. (2013). Deconstructing the construct: A network perspective on psychological phenomena. *New ideas in psychology*, 31(1), 43-53.

Two Year Network Stability



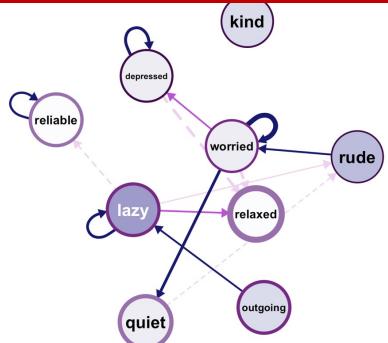
Split-half Network Stability



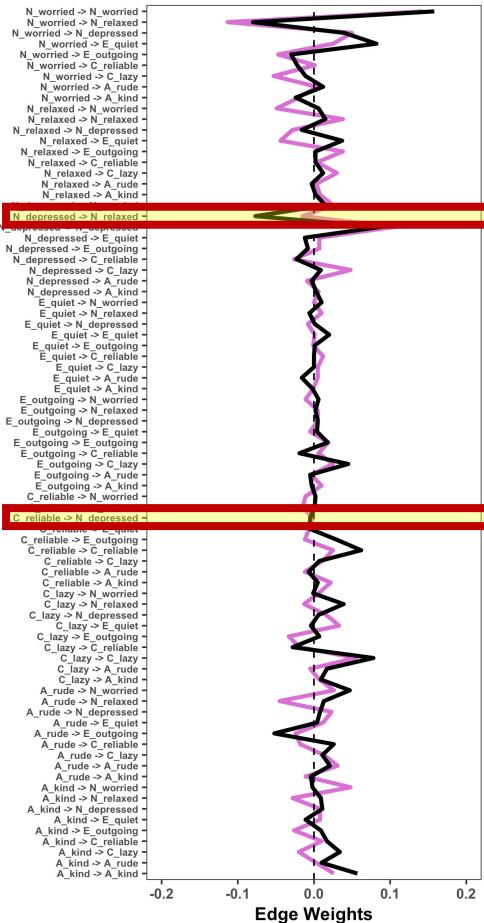
Group Level Temporal Personality Network Stability



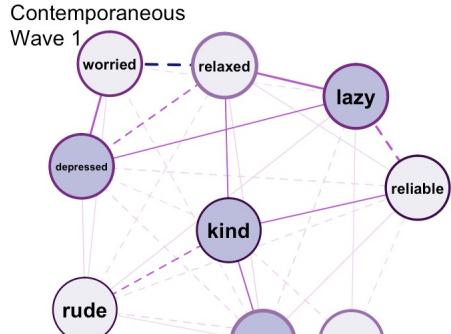
Edge Weight Stability
 $r = 0.68$



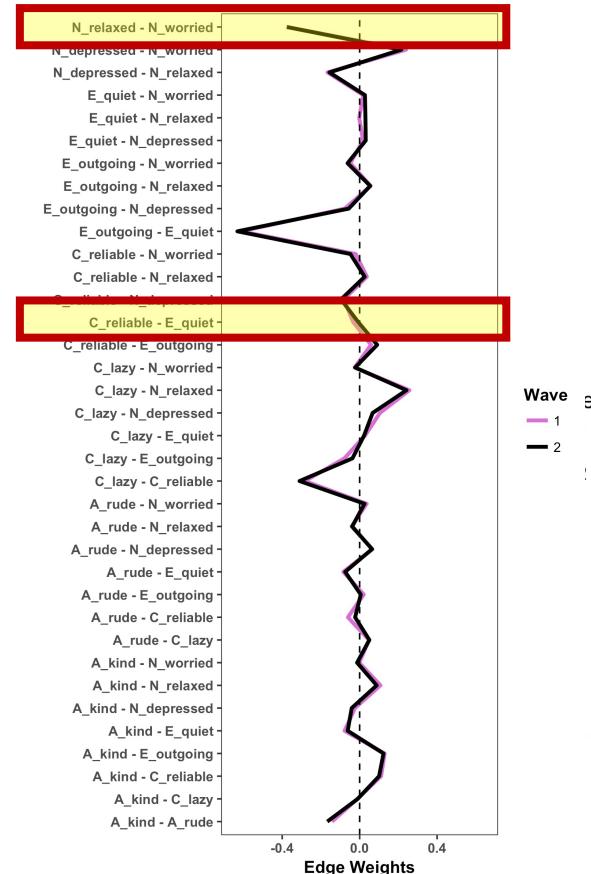
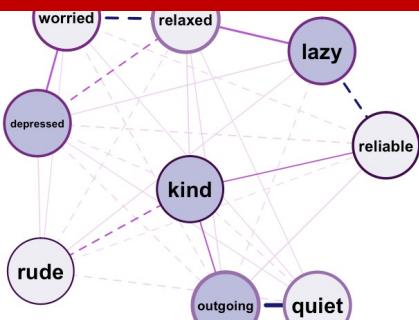
Wave 1



Group Level Contemporaneous Personality Network Stability



Edge Weight Stability
 $r = 0.99$



Composites		Edge Weights			Centrality			Density		
		A_kind	A_rude	C_lazy	C_reliable	E_outgoing	E_quiet	N_depressed	N_relaxed	N_worried
Sample Weights Matrix of Temporal Edge Weights										
A_kind		-0.06	-0.13	0.13	0.03	-0.27	0.51	-0.40	0.13	0.15
A_rude		0.57	0.05	-0.10	-0.21	0	0.61	-0.06	-0.11	-0.18
C_lazy		0.55	0.19	0	-0.27	-0.19	0.89	0.44	-0.37	0.09
C_reliable		0.64	0.04	0.51	-0.41	-0.15	0.59	-0.36	-0.17	-0.43
E_outgoing		0.23	0.04	-0.27	-0.31	0.11	-0.87	0.68	-0.29	0.02
E_quiet		-0.01	0.11	0.03	0	0	-0.62	0.13	0.19	0.07
N_depressed		0.30	0.03	0.14	-0.003	0.19	-0.21	-0.42	-0.19	0
N_relaxed		-0.11	-0.22	0.03	0.28	0.23	-0.86	0.07	0.45	0.24
N_worried		-0.27	-0.15	0	0.25	0	-0.76	-0.12	0.24	-0.14

Composites

Edge Weights

Centrality

Density

Sample Weights Matrix of Temporal Edge Weights

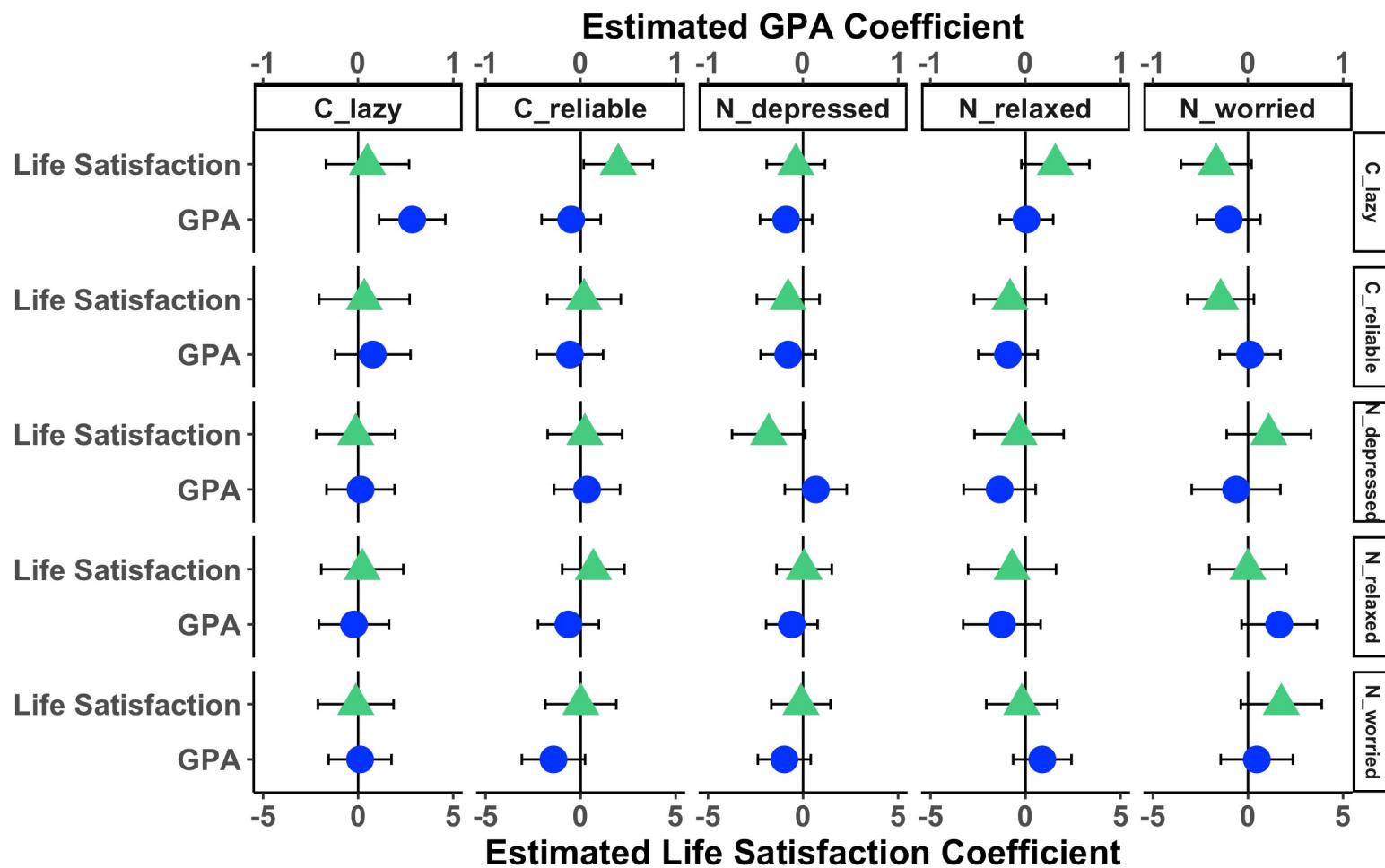
	C_lazy	C_reliable	N_depressed	N_relaxed	N_worried
C_lazy	0	-0.27	0.44	-0.37	0.09
C_reliable	0.51	-0.41	-0.36	-0.17	-0.43
N_depressed	0.14	-0.003	-0.42	-0.19	0
N_relaxed	0.03	0.28	0.07	0.45	0.24
N_worried	0	0.25	-0.12	0.24	-0.14

Composites

Edge Weights

Centrality

Density



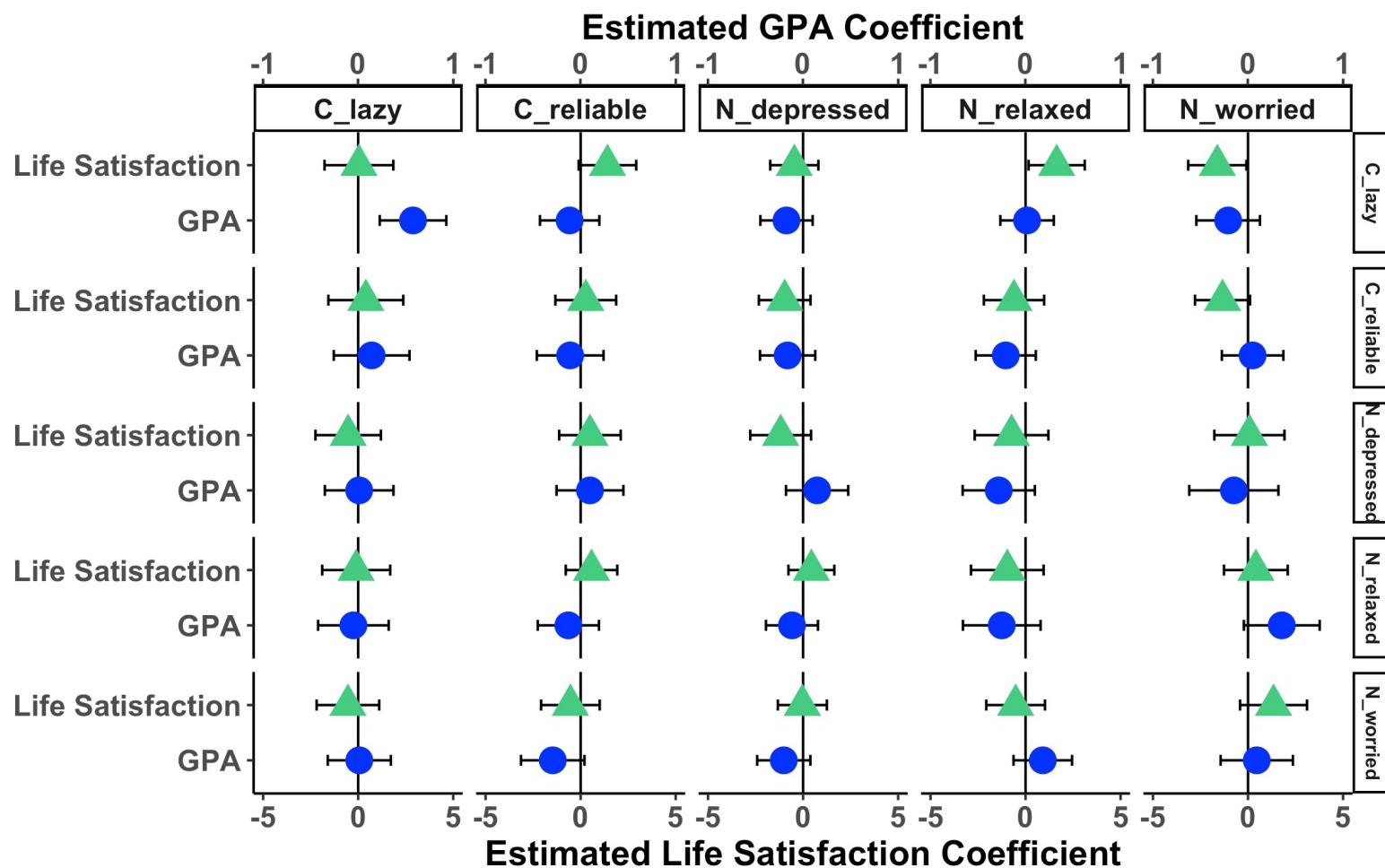
Zero order

Composites

Edge Weights

Centrality

Density



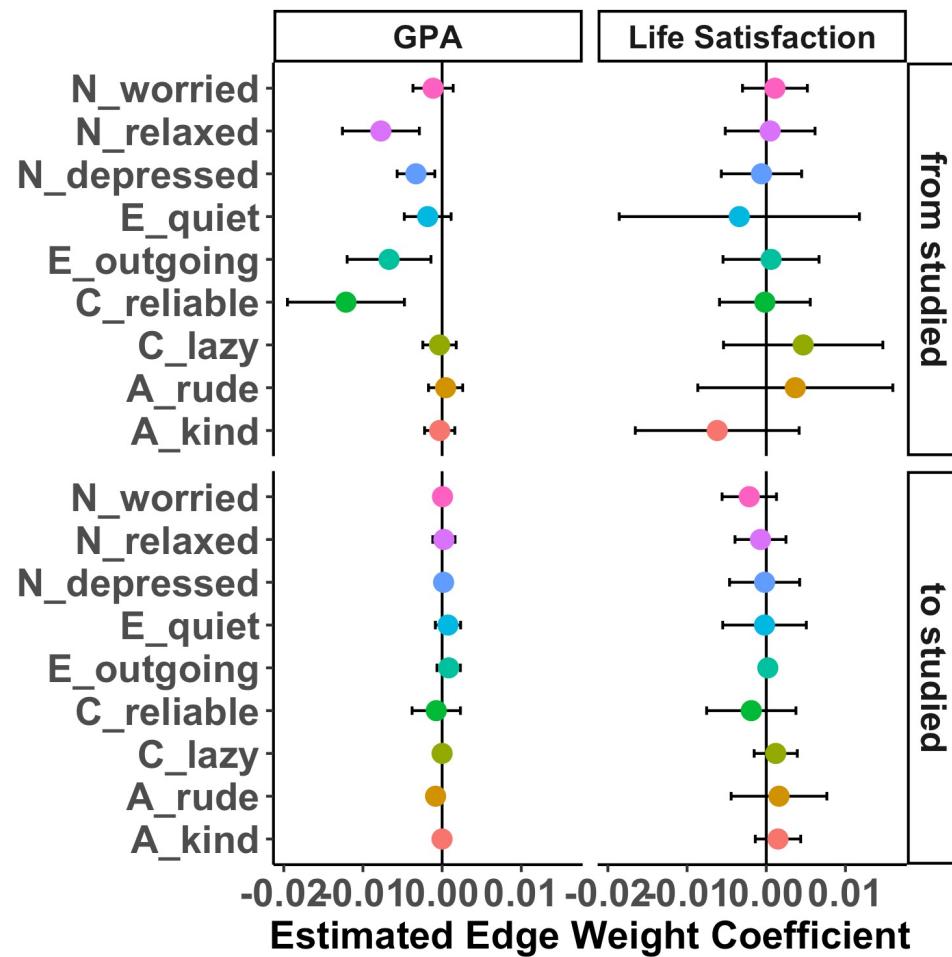
Controlling for C & N

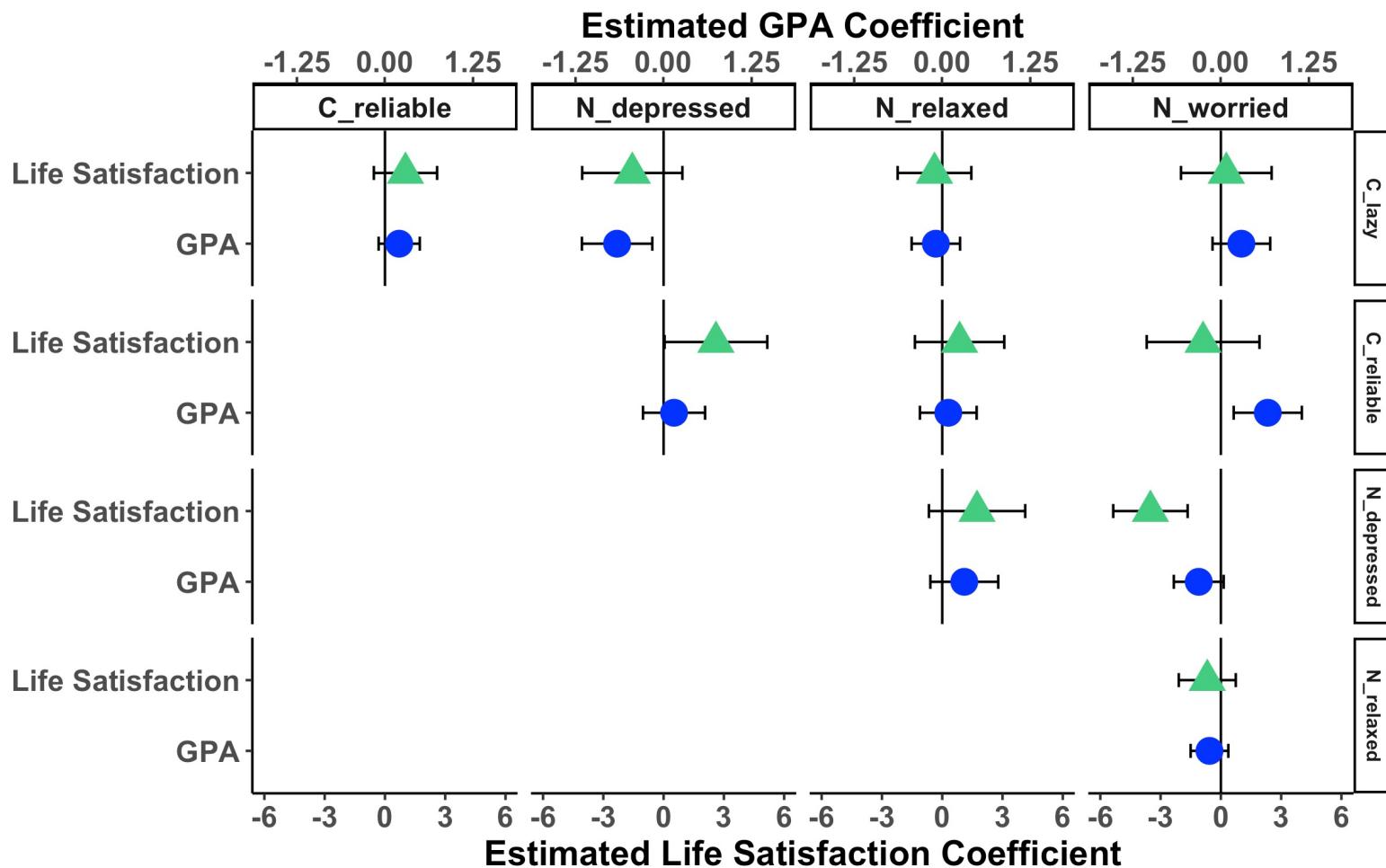
Composites

Edge Weights

Centrality

Density





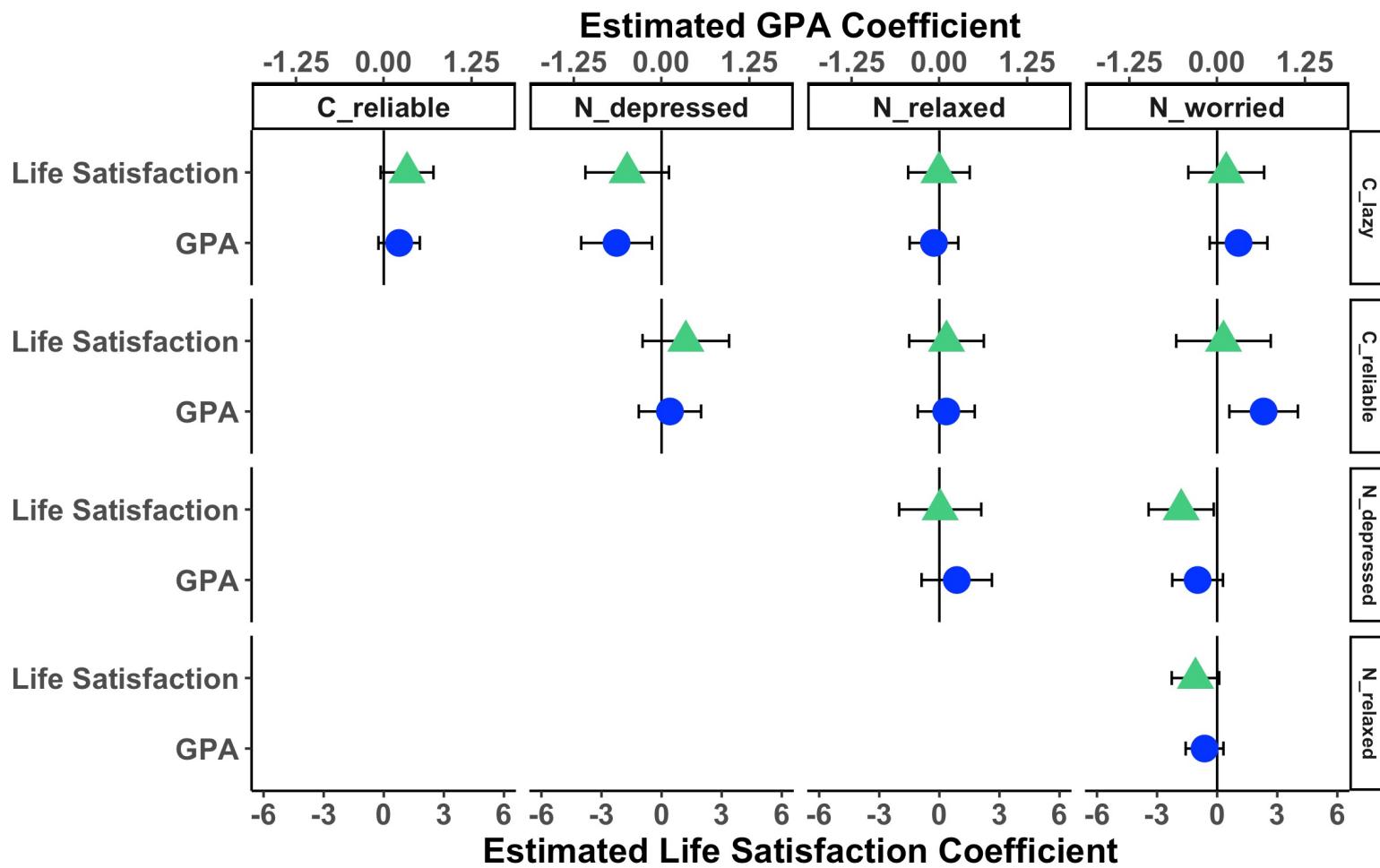
Zero Order

Composites

Edge Weights

Centrality

Density



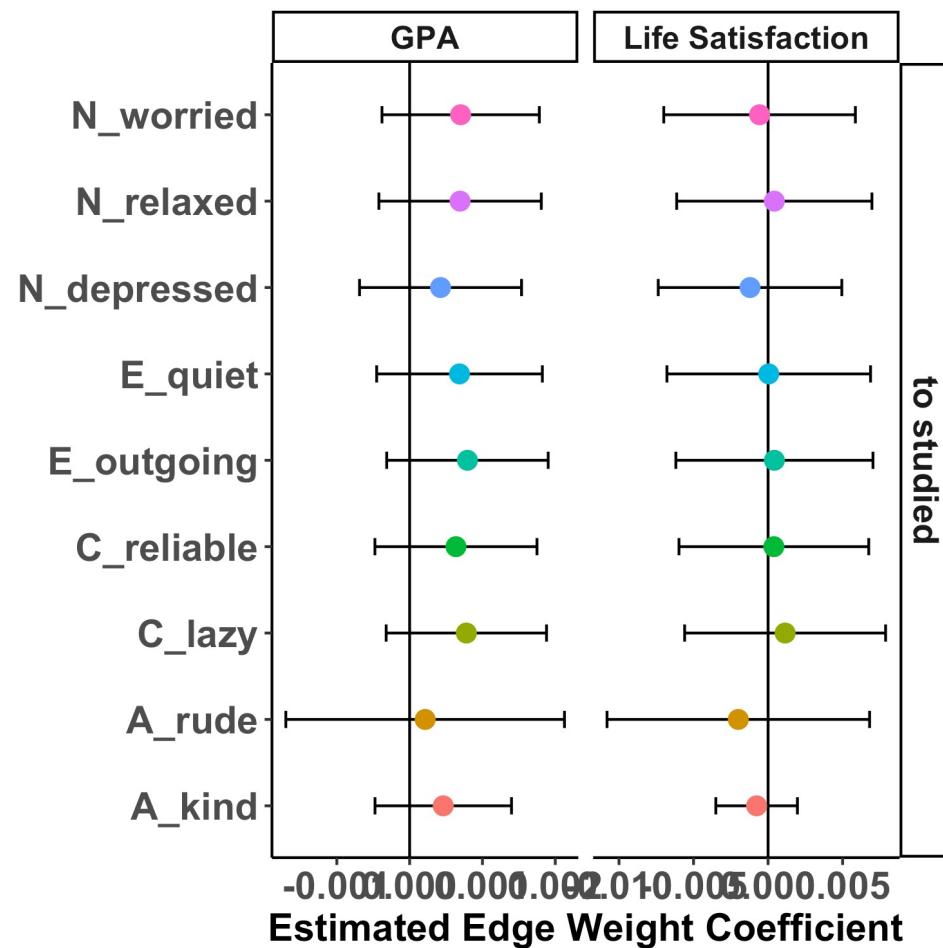
Controlling for C & N

Composites

Edge Weights

Centrality

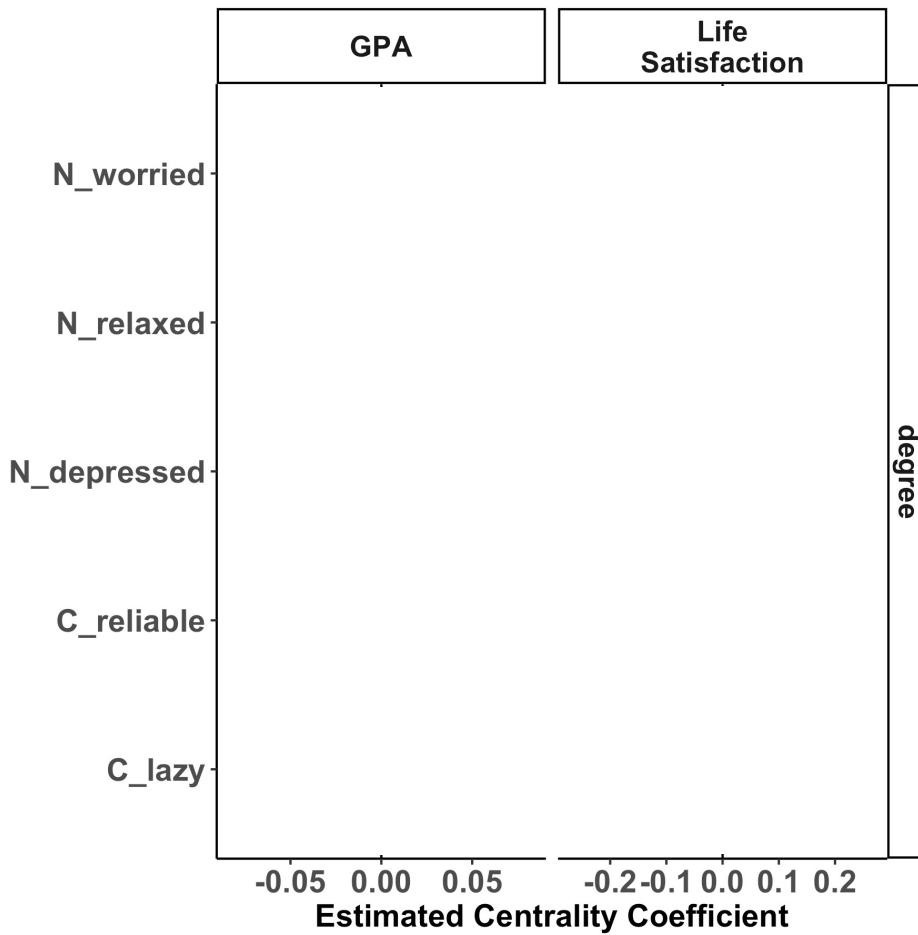
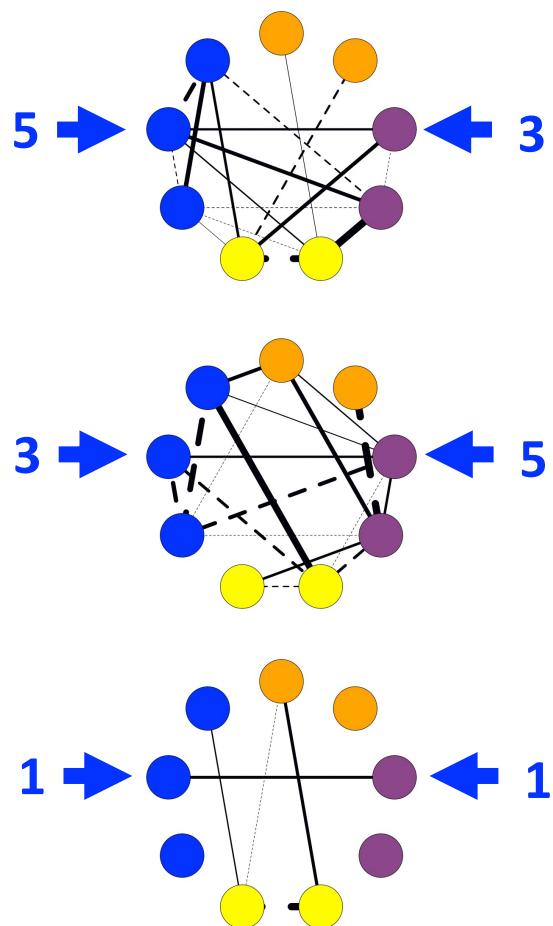
Density



Composites

Centrality

Density

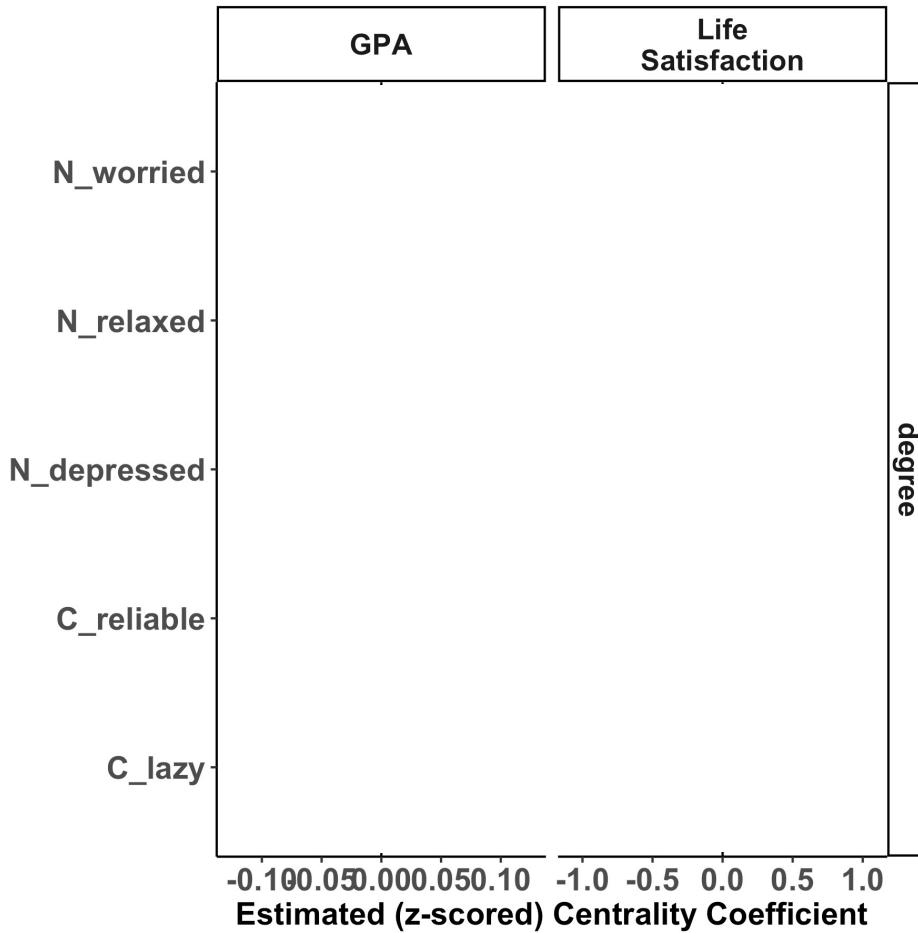
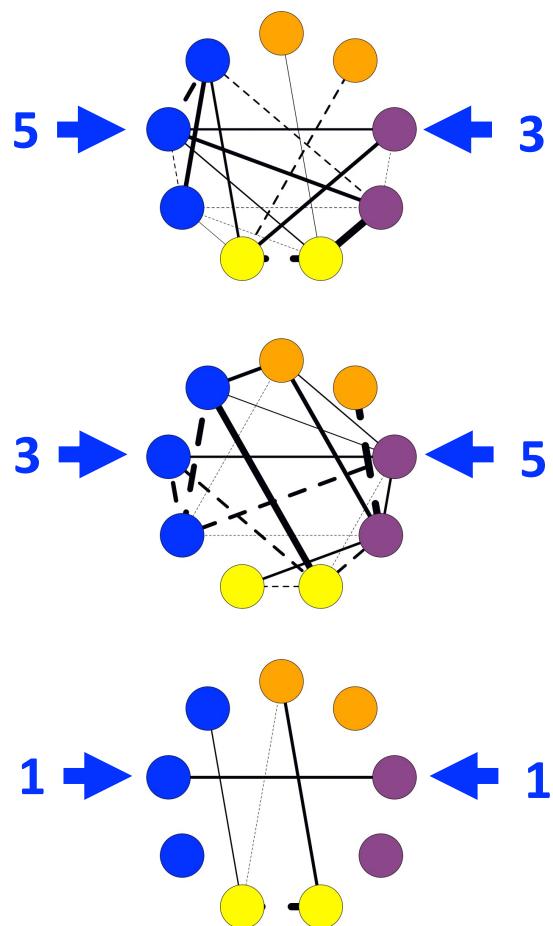


Contemporaneous, controlling for C+N

Composites

Centrality

Density

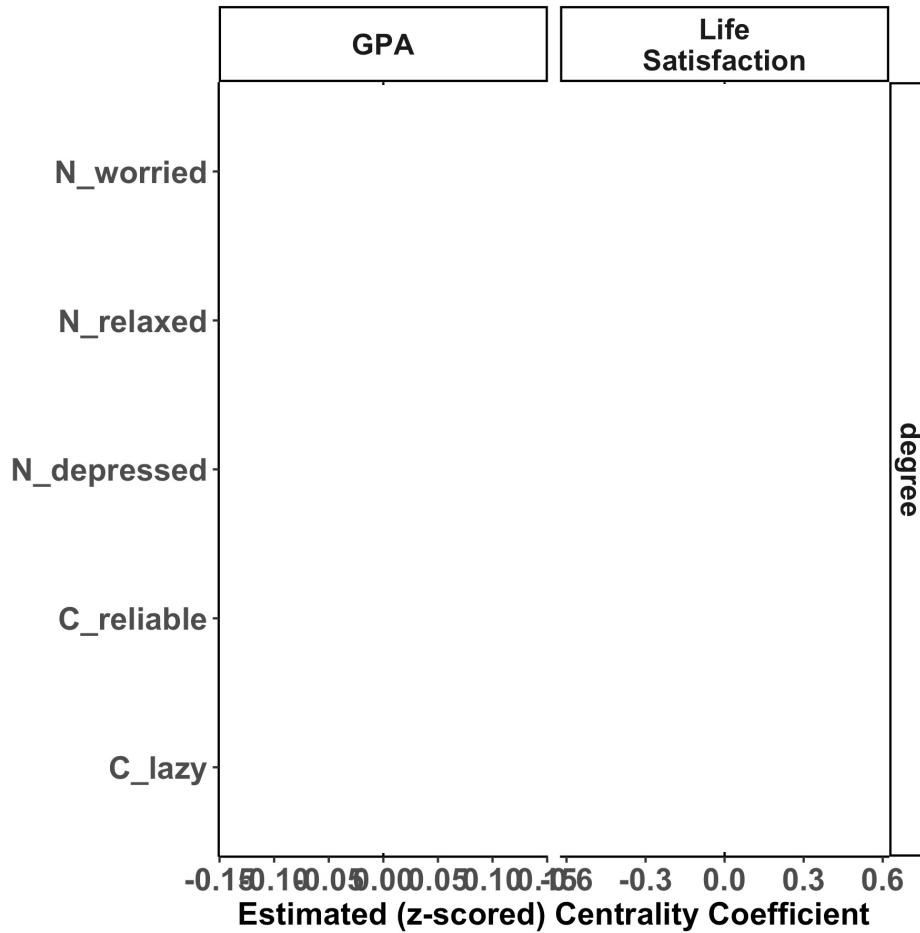
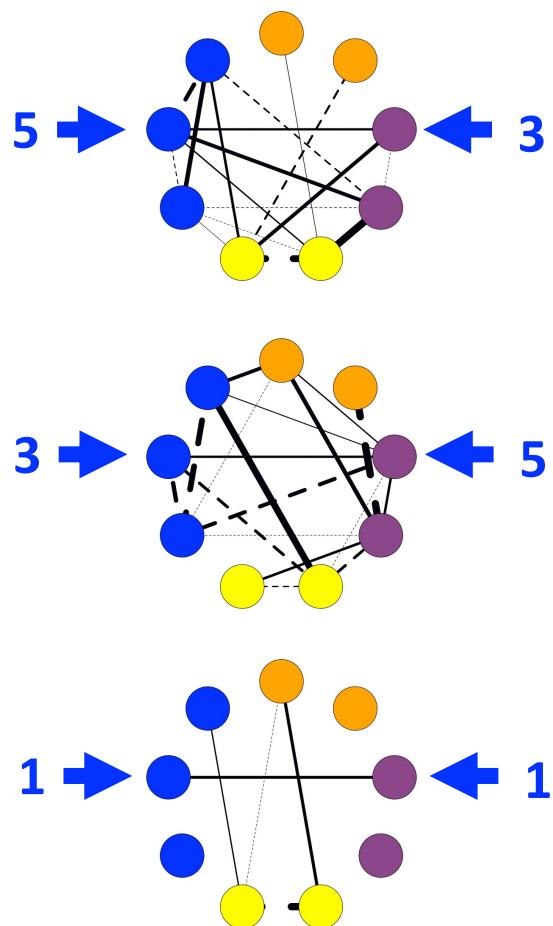


Contemporaneous, z-scored

Composites

Centrality

Density

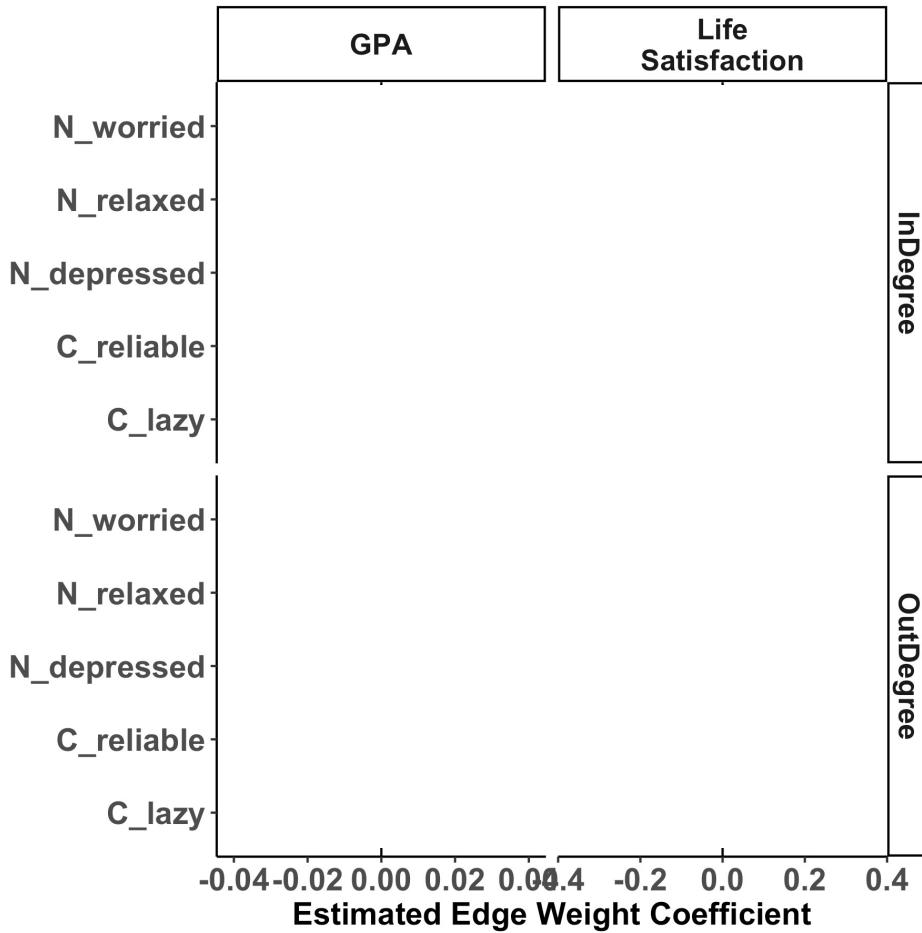
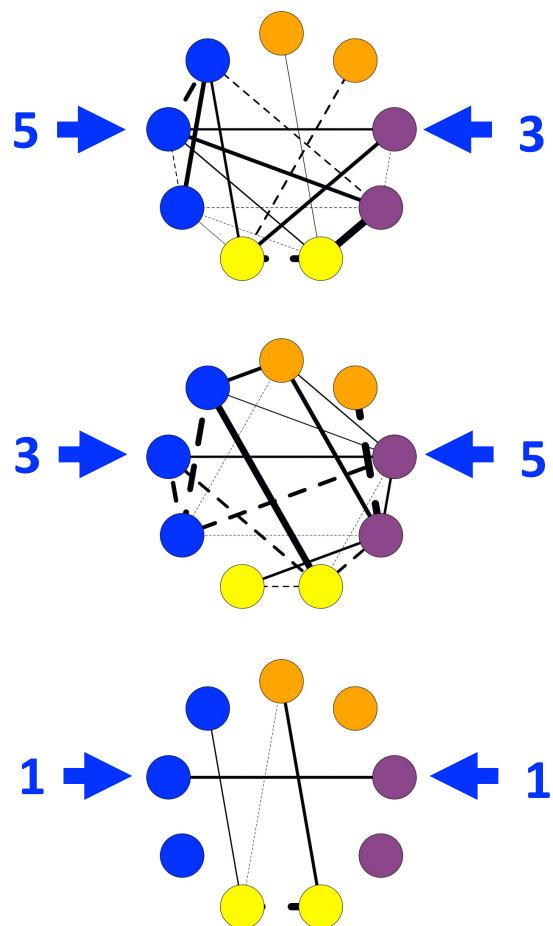


Contemporaneous, z-scored, controlling for C+N

Composites

Centrality

Density

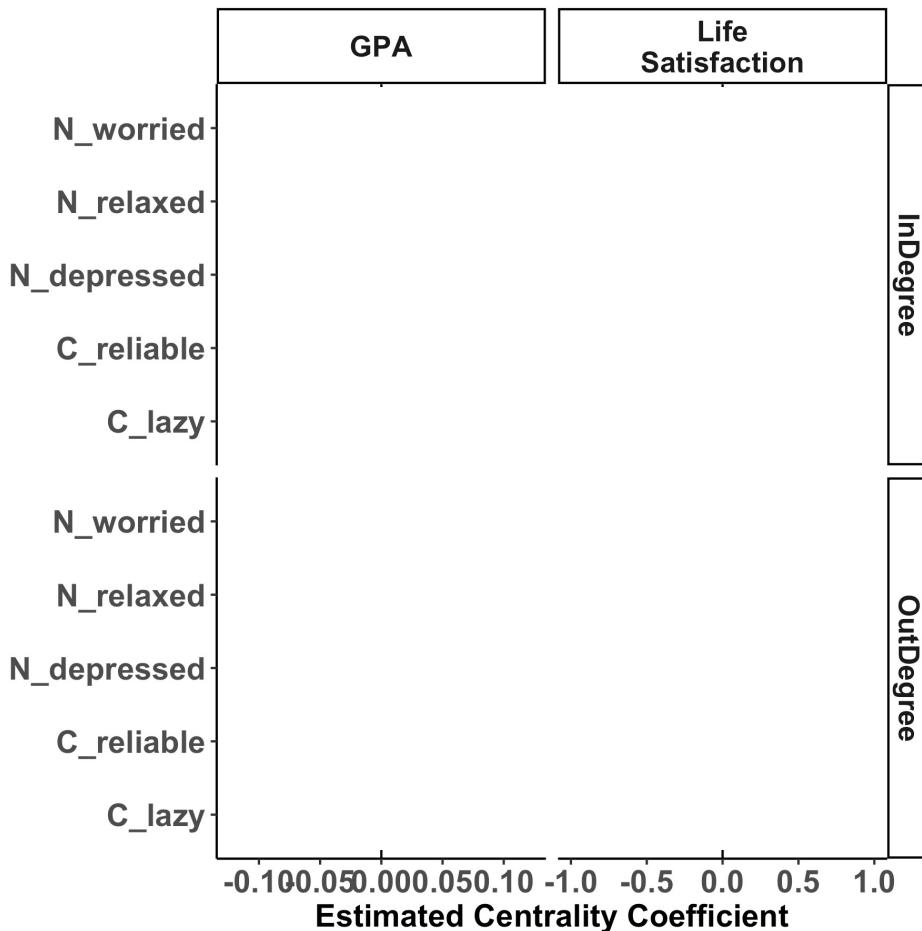
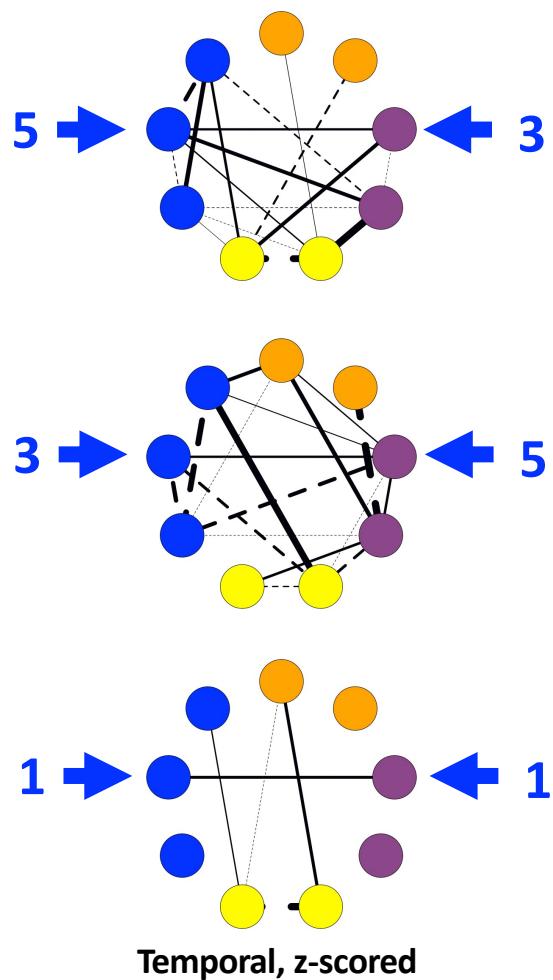


Temporal, controlling for C+N

Composites

Centrality

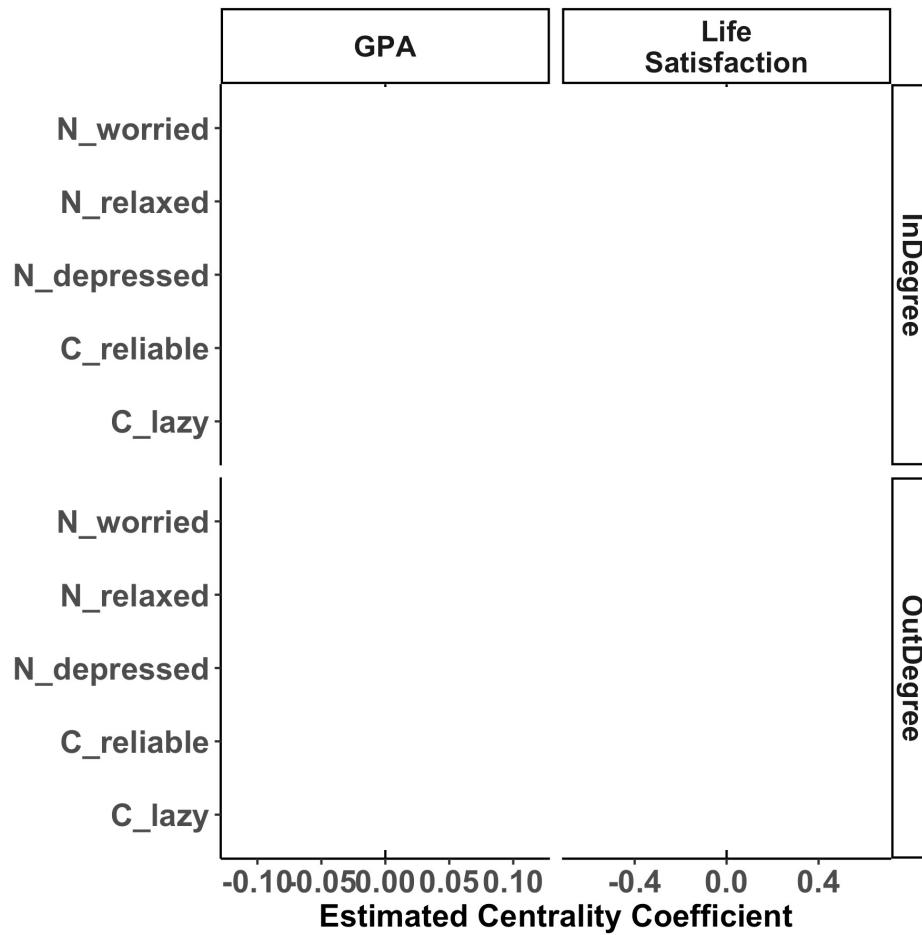
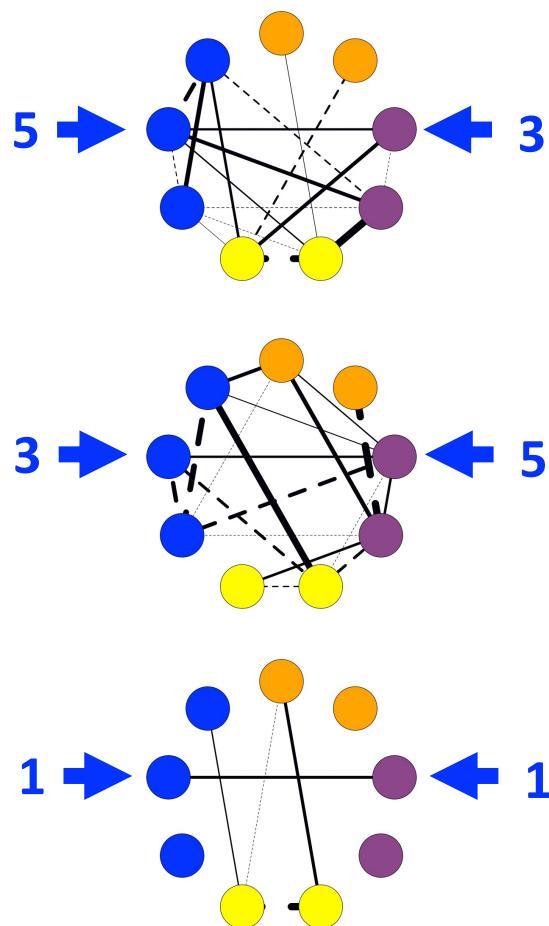
Density



Composites

Centrality

Density

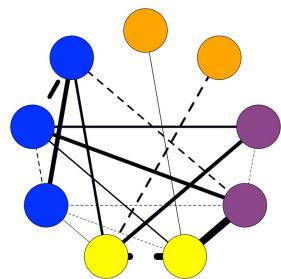


Temporal, z-scored, controlling for C+N

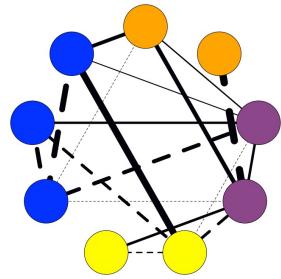
Composites

Centrality

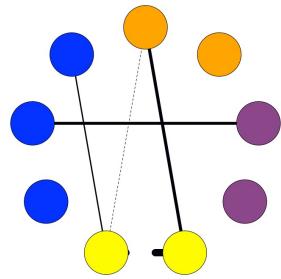
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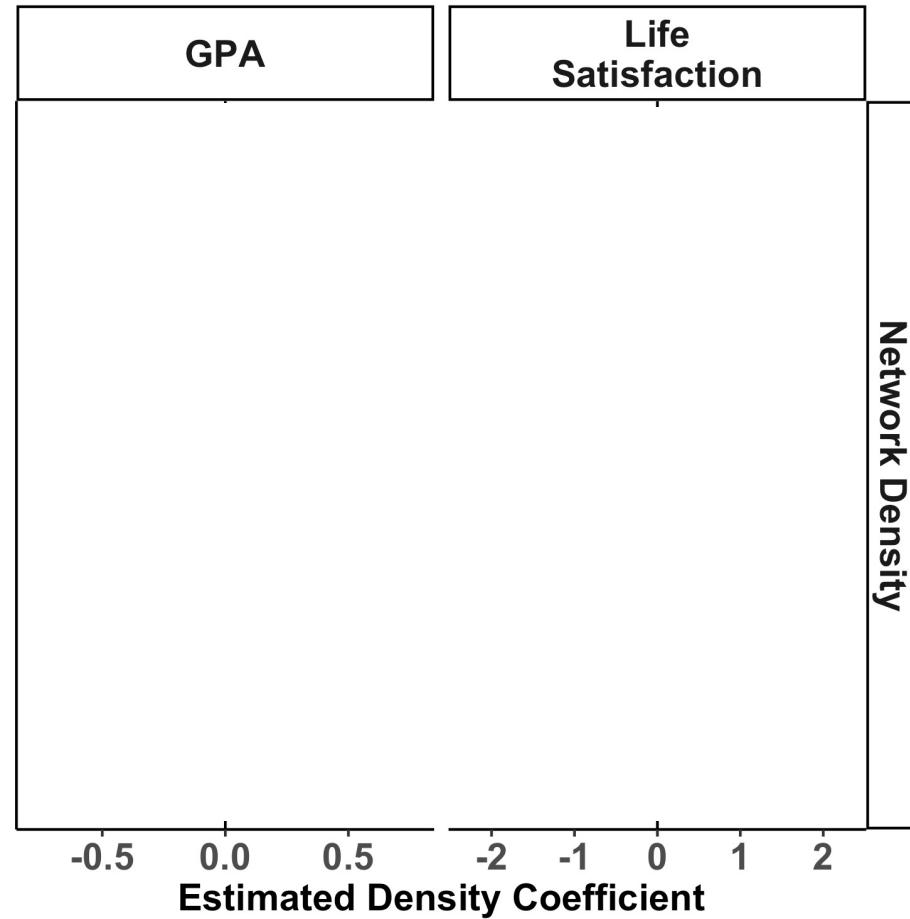
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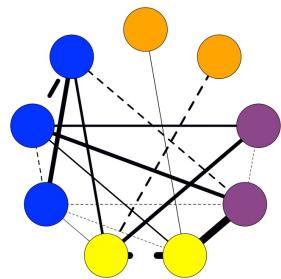


Contemporaneous, controlling for C+N

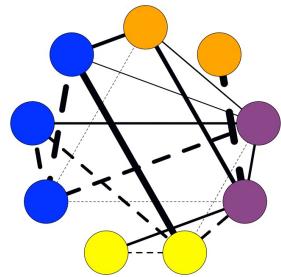
Composites

Centrality

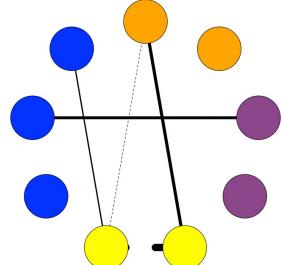
Density



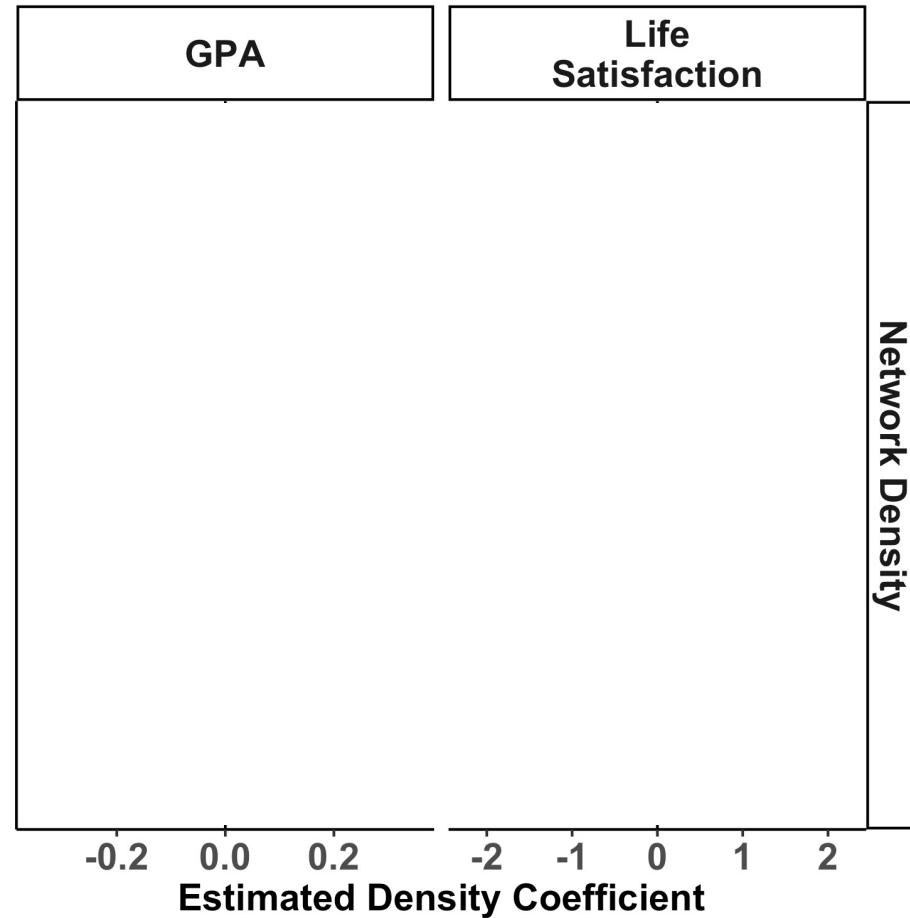
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Temporal, controlling for C+N