#### 

#### S1. ASD, ADHD, RAD/DAD networks

A close up of a map

Description automatically generated

#### S2. Centrality estimates all networks

A close up of a map

Description automatically generated

#### S3. ASD Bootstrapped Edge Weights

Graphical user interface

Description automatically generated

#### S4. ADHD Bootstrapped Edge weights

A picture containing flying, air, kite, person

Description automatically generated

#### S5. RAD/DAD Bootstrapped Edge weights

Graphical user interface

Description automatically generated

#### S6. Bootstrapped differences (alpha =0.05) in Strength centrality for RAD/DAD network

Chart, scatter chart

Description automatically generated

Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength value

*RAD/DAD Networks Strength centrality*

As shown in Figure 3, it would appear that “lies/ argumentative with adults” (Con4), “restless & fidgety” (Hyp 1.2), “completes tasks” (Hyp5), “distractible” (“Hyp3”) and “considerate” (pros1). However, in light of the centrality stability analysis and the fairly wide confidence intervals observed during bootstrapping, RAD/DAD networksshould be interpreted as especially exploratory. Further, the nonparametric test of differences in Strength yielded no significant items. This indicates that no items were statistically more different in terms of Strength centrality compared to other items.

#### S7. Descriptive Statistics for the entire cohort (n = 11,443)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Index Diagnosis | N | Age | | | Gender | Ever diagnosis |  |  |
|  |  | Mean Age (Y) | Median  (Y) | SD | (%  Male) | ASD/ ADHD | ADHD/  ASD | ASD or ADHD and RAD/ DAD |
| ASD | 6312 | 10.7 | 11 | 3.7 | 76.1% | 1136 | - | - |
| ADHD | 4944 | 10.6 | 10 | 3.4 | 81.4% | - | 568 | - |
| RAD/ DAD | 187 | 8.8 | 8 | 4.1 | 70% | - | - | 37 |

Y=Years, SD = Standard Deviation

S8. Participant flow chart

Diagram

Description automatically generated

#### S9. Item level SDQ Descriptive Statistics

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Item | ASD | | | | ADHD | | | | RAD/DAD | |  |  |
|  | Mean | SD | Skew | Kurtosis | Mean | SD | Skew | Kurtosis | Mean | SD | Skew | Kurtosis |
| Con1: Temper | 1.42 | 0.74 | -0.86 | -0.68 | 1.53 | 0.67 | -1.11 | -0.02 | 1.41 | 0.68 | -0.67 | -0.73 |
| Con2: Obedient | 1.05 | 0.69 | -0.07 | -0.89 | 1.28 | 0.67 | -0.38 | -0.79 | 1.05 | 0.76 | -0.08 | -1.31 |
| Con3: Fights with peers | 0.51 | 0.71 | 1.04 | -0.29 | 0.87 | 0.79 | 0.24 | -1.36 | 0.69 | 0.69 | 0.46 | -.0.94 |
| Con4: Lies/ argumentative with adults | 0.61 | 0.77 | 0.80 | -0.88 | 1.06 | 0.77 | -0.10 | -1.32 | 1.21 | 0.77 | -0.35 | -1.28 |
| Con5: Steals/ spiteful | 0.28 | 0.59 | 1.97 | 2.64 | 0.53 | 0.75 | 1.02 | -0.48 | 0.69 | 0.80 | 0.58 | -1.24 |
| Emo1: Aches | 0.80 | 0.81 | 0.37 | -1.40 | 0.79 | 0.79 | 0.39 | -1.29 | 0.72 | 0.79 | 0.52 | -1.27 |
| Emo2: Worries | 1.25 | 0.78 | -0.47 | -1.21 | 0.90 | 0.77 | 0.17 | -1.29 | 0.97 | 0.78 | 0.04 | -1.39 |
| Emo3: Unhappy or downhearted | 0.96 | 0.77 | 0.07 | -1.32 | 0.74 | 0.73 | 0.46 | -1.04 | 0.77 | 0.71 | 0.33 | -1.03 |
| Emo4: Clingy in new situations | 1.42 | 0.74 | -0.85 | -0.71 | 1.05 | 0.83 | -0.09 | -1.54 | 1.21 | 0.83 | -0.38 | -1.49 |
| Emo5: Fearful | 1.17 | 0.78 | -0.31 | -1.31 | 0.75 | 0.79 | 0.47 | -1.25 | 0.90 | 0.79 | 0.17 | -1.41 |
| Hyp1.2: Restless & Fidgety | 1.22 | 0.86 | -0.43 | -1.51 | 1.75 | 0.56 | -2.10 | 3.27 | 1.33 | 0.84 | -0.66 | -1.29 |
| Hyp3: Distractible | 1.54 | 0.67 | -1.12 | 0.02 | 1.89 | 0.36 | -3.49 | 12.27 | 1.69 | 0.52 | -1.33 | 0.75 |
| Hyp4: Thinks things out before acting | 1.47 | 0.67 | -0.89 | -0.39 | 1.64 | 0.61 | -1.51 | 1.11 | 1.51 | 0.56 | -0.50 | -0.96 |
| Hyp5: Completes tasks | 1.47 | 0.67 | -0.90 | -0.38 | 1.74 | 0.54 | -1.92 | 2.75 | 1.54 | 0.64 | -1.01 | -0.16 |
| Pros1: Considerate | 0.92 | 0.70 | 0.11 | -0.95 | 1.08 | 0.63 | -0.07 | -0.51 | 1.08 | 0.66 | -0.08 | -0.80 |
| Pros2: Shares with peers | 0.86 | 0.73 | 0.22 | -1.13 | 1.07 | 0.67 | -0.09 | -0.80 | 1.13 | 0.73 | -0.19 | -1.17 |
| Pros3: Helpful when someone is hurt | 1.05 | 0.76 | -0.09 | -1.25 | 1.38 | 0.66 | -0.60 | -0.68 | 1.31 | 0.66 | -0.38 | -0.84 |
| Pros4: Kind to younger children | 1.36 | 0.71 | -0.66 | -0.82 | 1.50 | 0.63 | -0.88 | -0.27 | 1.51 | 0.64 | -0.91 | -0.32 |
| Pros5: Volunteers help | 0.88 | 0.76 | 0.21 | -1.27 | 1.16 | 0.72 | -0.24 | -1.08 | 1.41 | 0.68 | -0.67 | -0.73 |
| Prp1: Solitary | 1.36 | 0.70 | -0.62 | -0.80 | 0.77 | 0.76 | 0.42 | -1.15 | 0.90 | 0.72 | 0.14 | -1.11 |
| Prp2: Good Friend(s) | 0.95 | 0.83 | 0.10 | -1.54 | 0.59 | 0.73 | 0.83 | -0.70 | 0.79 | 0.73 | 0.32 | -1.14 |
| Prp3: Popular with peers | 0.85 | 0.69 | 0.21 | -0.91 | 0.69 | 0.64 | 0.39 | -0.72 | 0.67 | 0.62 | 0.33 | -0.78 |
| Prp4: Victimised by other children | 0.84 | 0.78 | 0.29 | -1.31 | 0.72 | 0.75 | 0.51 | -1.07 | 0.56 | 0.75 | 0.87 | -0.76 |
| Prp5: Better relationship with adults than peers | 1.19 | 0.77 | -0.35 | -1.26 | 0.91 | 0.77 | 0.16 | -1.29 | 0.79 | 0.70 | 0.28 | -0.99 |

*SD = Standard Deviation; Skew = Skewness*

S10. Line graph with SDQ scales and Total Difficulties

Chart, line chart

Description automatically generated

#### S11. Unadjusted and Adjusted mean values following analysis of variance

|  |  |  |
| --- | --- | --- |
| Scale | ASD | ADHD |
| Emotional Problems |  |  |
| Unadjusted | 5.60 | 4.23 |
| Adjusted | 5.57 | 4.27 |
|  |  |  |
| Conduct problems |  |  |
| Unadjusted | 3.87 | 5.26 |
| Adjusted | 3.89 | 5.24 |
|  |  |  |
| Hyperactivity |  |  |
| Unadjusted | 6.88 | 8.66 |
| Adjusted | 6.93 | 8.60 |
|  |  |  |
| Peer Problems |  |  |
| Unadjusted | 5.19 | 3.67 |
| Adjusted | 5.17 | 3.69 |
|  |  |  |
| Pro Social |  |  |
| Unadjusted | 5.07 | 6.19 |
| Adjusted | 5.07 | 6.19 |

S12. Edge Strength ASD and ADHD

Chart, line chart

Description automatically generated

*Please note differences in x and y-axis.*

S13. Stability of Centrality Estimates for each network

A screenshot of a computer

Description automatically generated

S14. Bootstrapped differences (alpha =0.05) in Strength centrality for ASD network

A close up of a cage

Description automatically generated

Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength values.

S15. Bootstrapped differences (alpha =0.05) in Strength centrality for ADHD network

A close up of a tiled wall

Description automatically generated

Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength value.

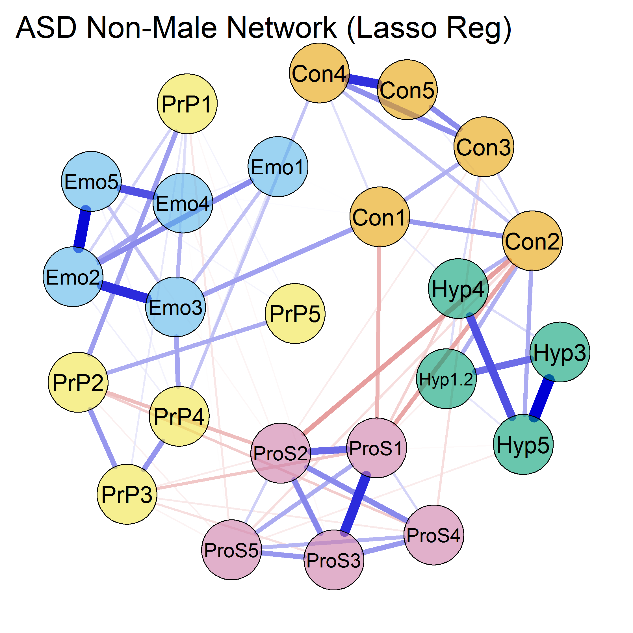
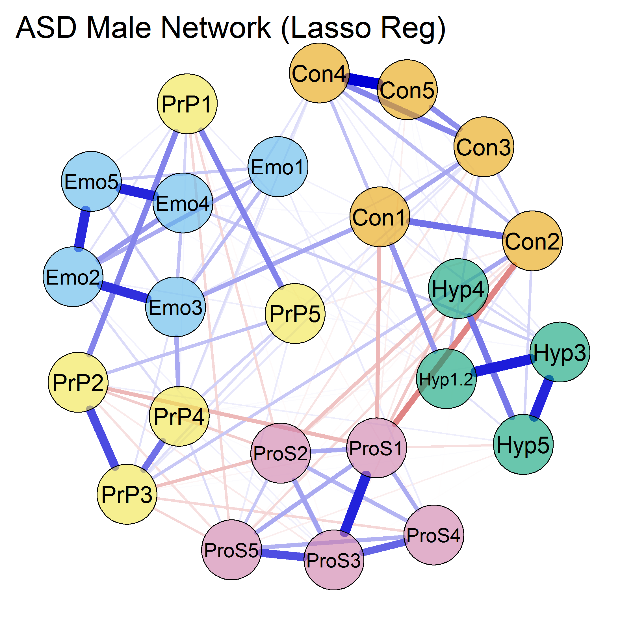
S16. Community detection using Spin glass

*Diagram

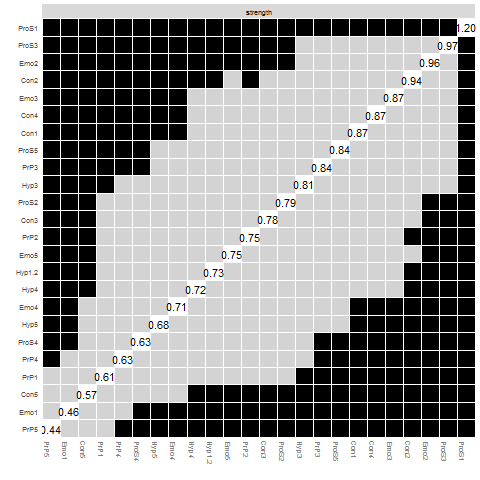
Description automatically generated*

*In these networks communities of nodes are identified by their colours.*

#### S17. ASD Gender Networks

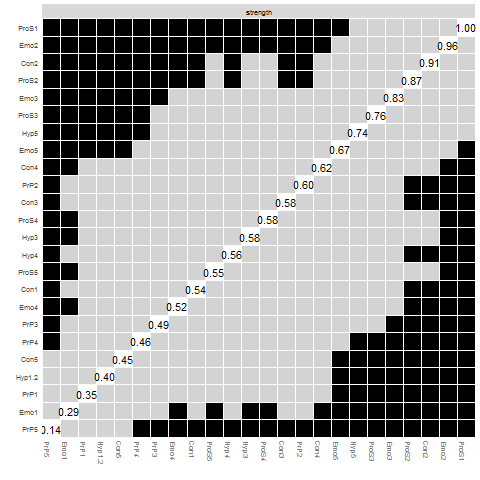


#### S18. Bootstrapped differences edge strength centrality ASD Male network (alpha = 0.05)



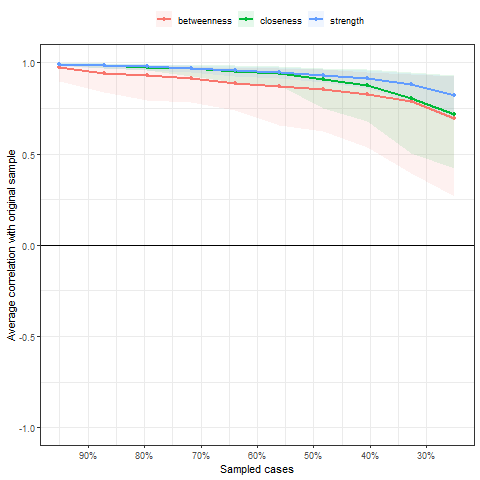
Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength value

#### S19. Bootstrapped differences edge strength centrality ASD Non-Male network (alpha = 0.05)

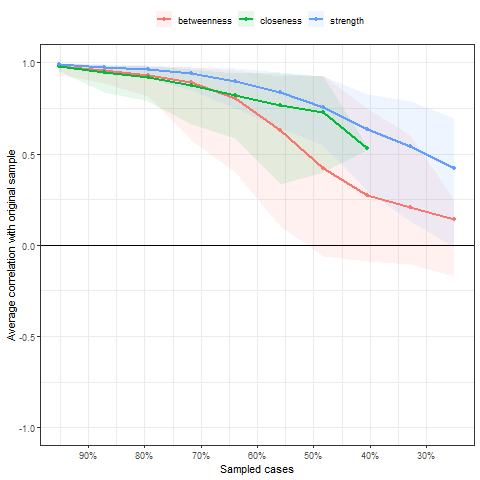


Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength value

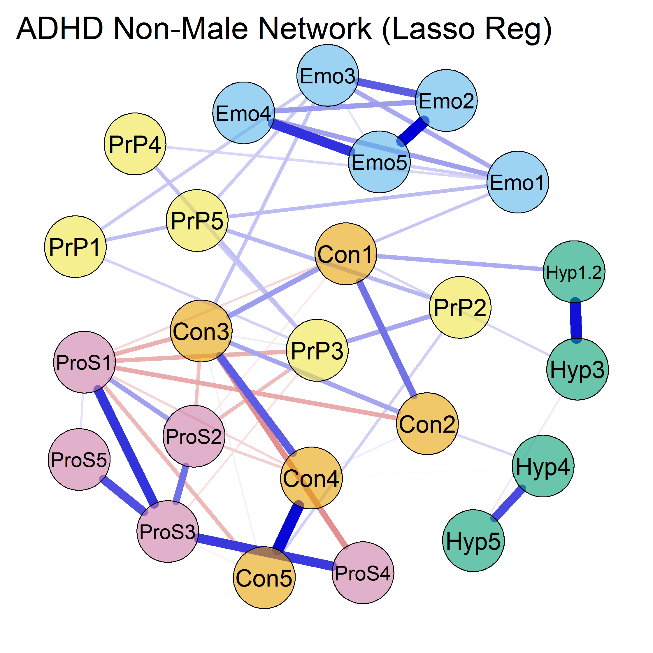
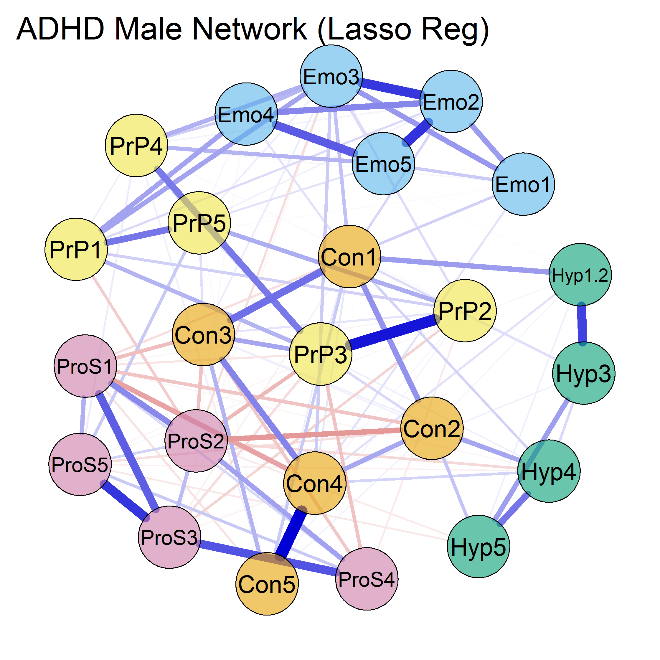
#### S20. Stability of Centrality Estimates ASD Male Network



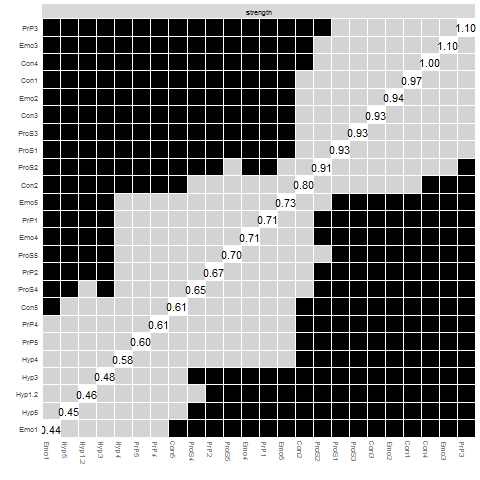
#### S21. Stability of Centrality Estimates ASD Non-Male Network



#### S22. ADHD Gender network

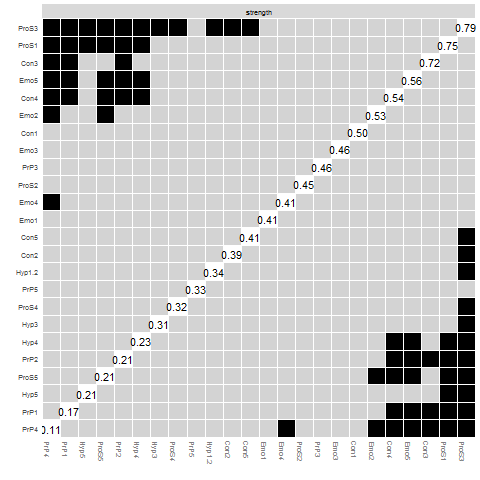
****

#### S23. Bootstrapped differences edge strength centrality ADHD Male network (alpha = 0.05)

****

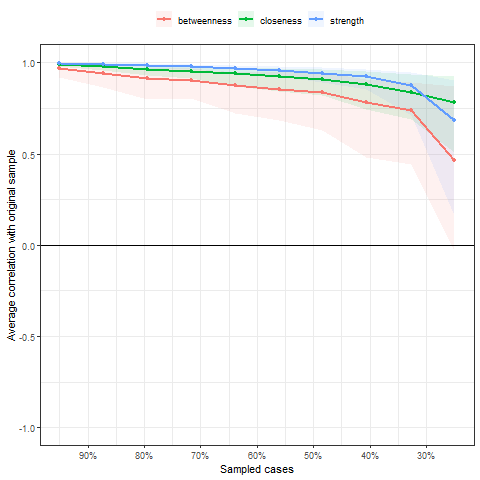
Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength value

#### S24. Bootstrapped differences edge strength centrality ADHD Non-Male network (alpha = 0.05)

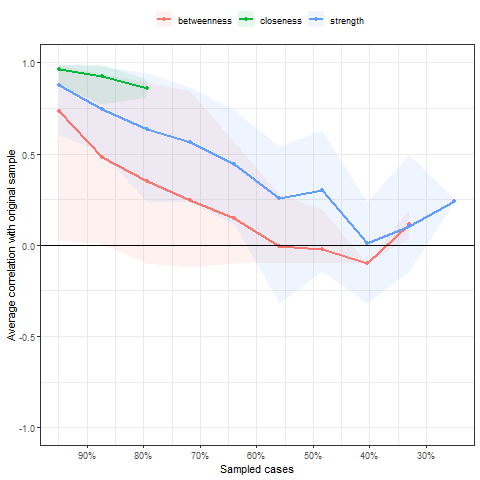
****

Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength value

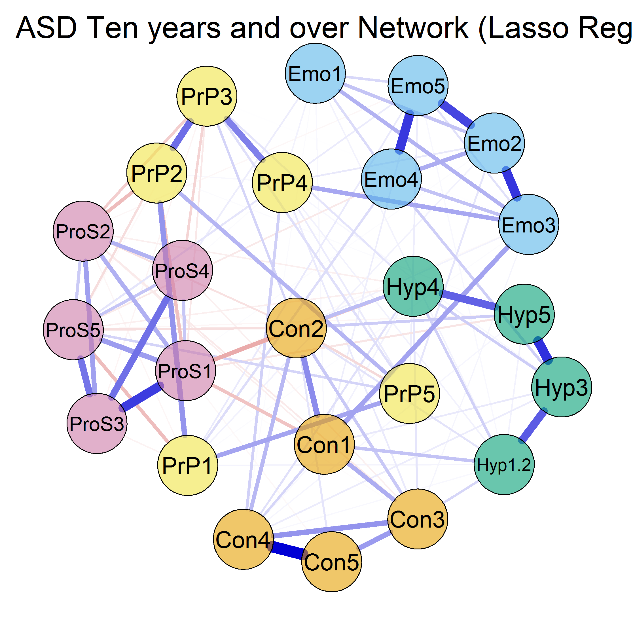
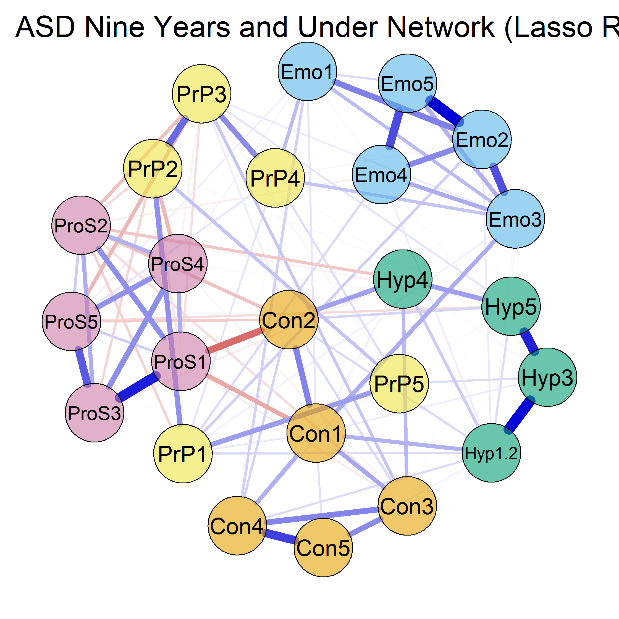
#### S25. Stability of Centrality Estimates ADHD Male Network

****

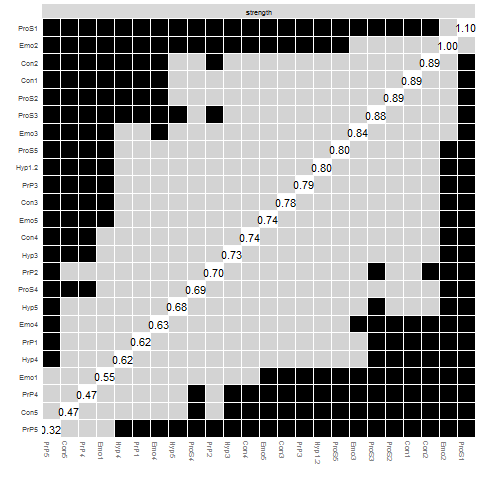
#### S26. Stability of Centrality Estimates ADHD Non-Male Network

****

#### S27. ASD AGE Networks

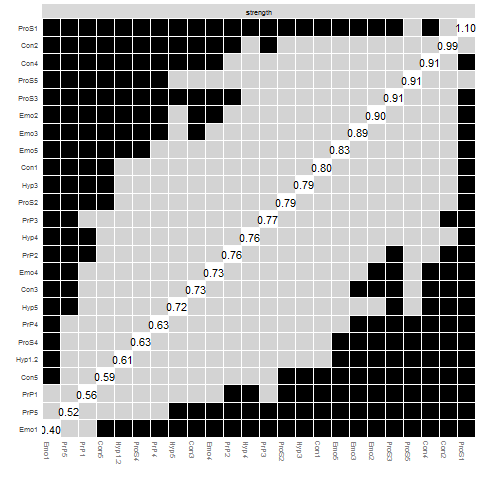
****

#### S28. Bootstrapped differences edge strength centrality ASD Nine years and under network (alpha = 0.05)



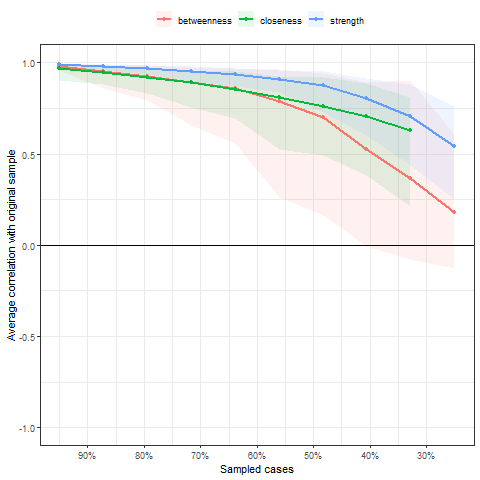
Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength value

#### S29. Bootstrapped differences edge strength centrality ASD ten years and over network (alpha = 0.05)

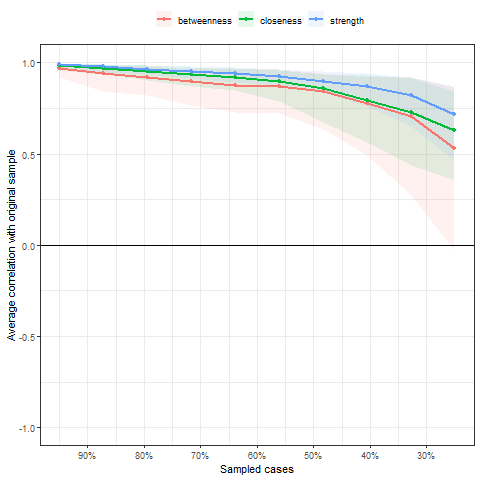


Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength value

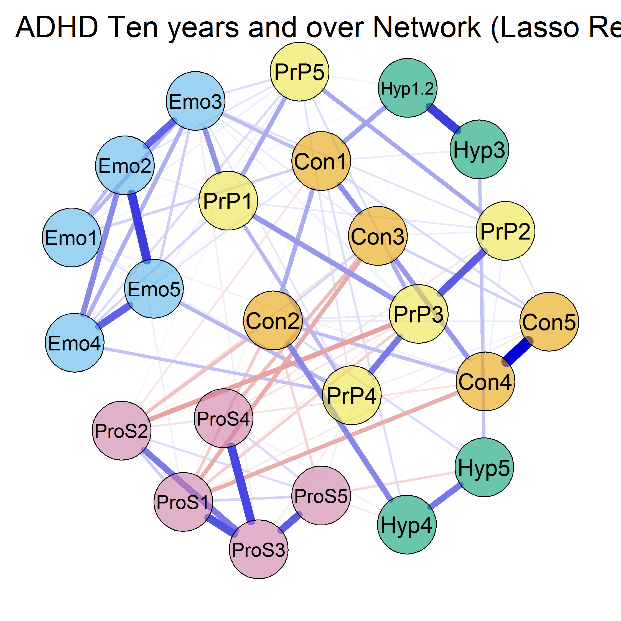
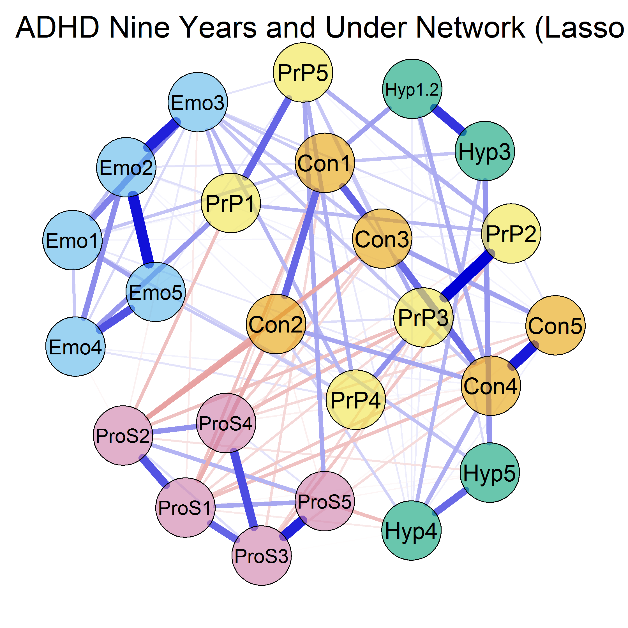
#### S30. Stability of Centrality Estimates ASD nine years and under Network



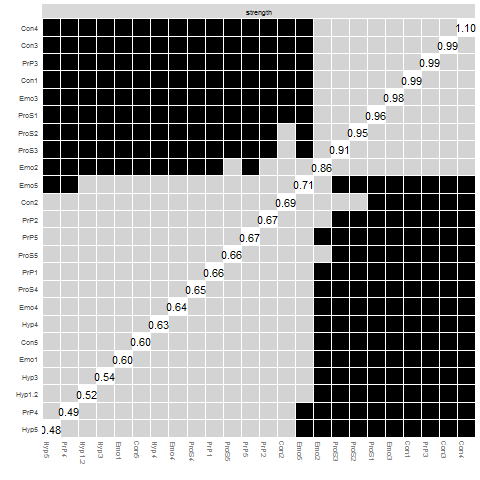
#### S31. Stability of Centrality Estimates ASD ten years and older Network



#### S32. ADHD Age Networks

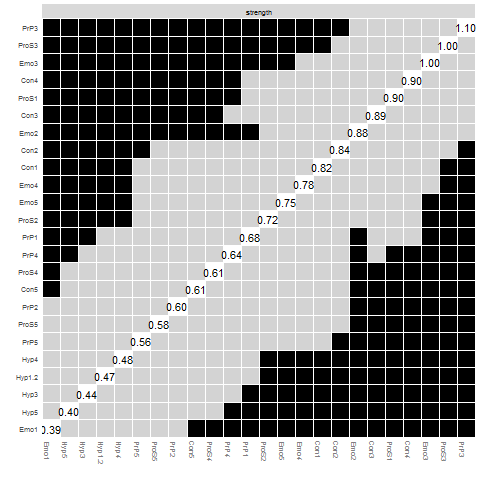


#### S33. Bootstrapped differences Edge Strength centrality ADHD nine years and under (alpha = 0.05)



Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength value

#### S34. Bootstrapped differences edge strength centrality ADHD ten years and older (alpha = 0.05)



Non-parametric bootstrap (number of bootstraps = 2000). Black boxes represent statistically significant differences (alpha = 0.05), whereas grey boxes denote non-significant differences. Values cutting diagonally across the centre line are strength value

#### S35. Stability of Centrality Estimates ADHD nine years and under

Chart

Description automatically generated

#### S36. Stability of Centrality Estimates ADHD ten years and older

Chart

Description automatically generated