

The genetics of the functional connectome

Daniel Roelfs



Background

- Brain structure correlates with SCZ
- Brain structural genetics correlates with SCZ genetics
- What are the genetic patterns underlying the phenotypic correlations?



Background

- Brain structure correlates with SCZ
- Brain structural genetics correlates with SCZ genetics
- What are the genetic patterns underlying the phenotypic correlations?



Background

- Brain structure correlates with SCZ
- Brain structural genetics correlates with SCZ genetics
- What are the genetic patterns underlying the phenotypic correlations?

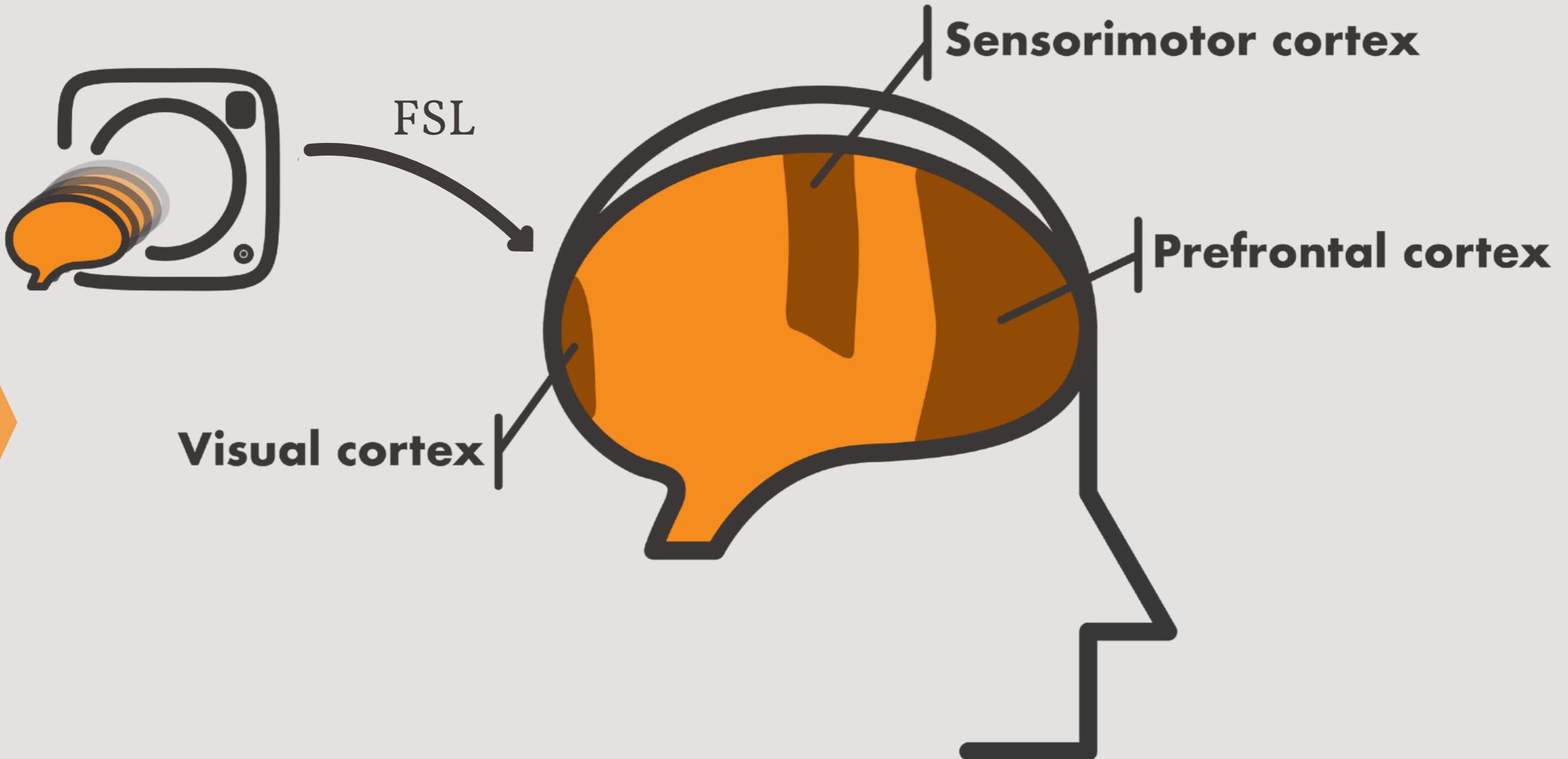






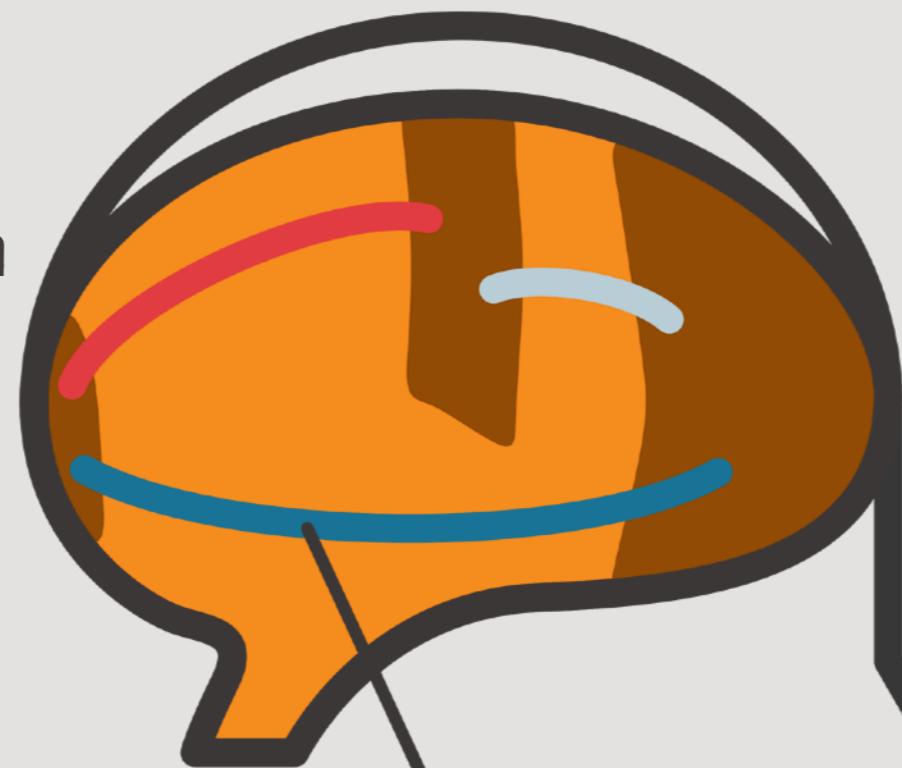
FSL







FSL



Connectivity strength

level of correlation in
activation patterns between
networks



FSL



Node variance

degree of random variation in activation over time



Genome-wide association study

multivariate and univariate GWAS of
fMRI features using MOSTest

2IO x connectivity strength

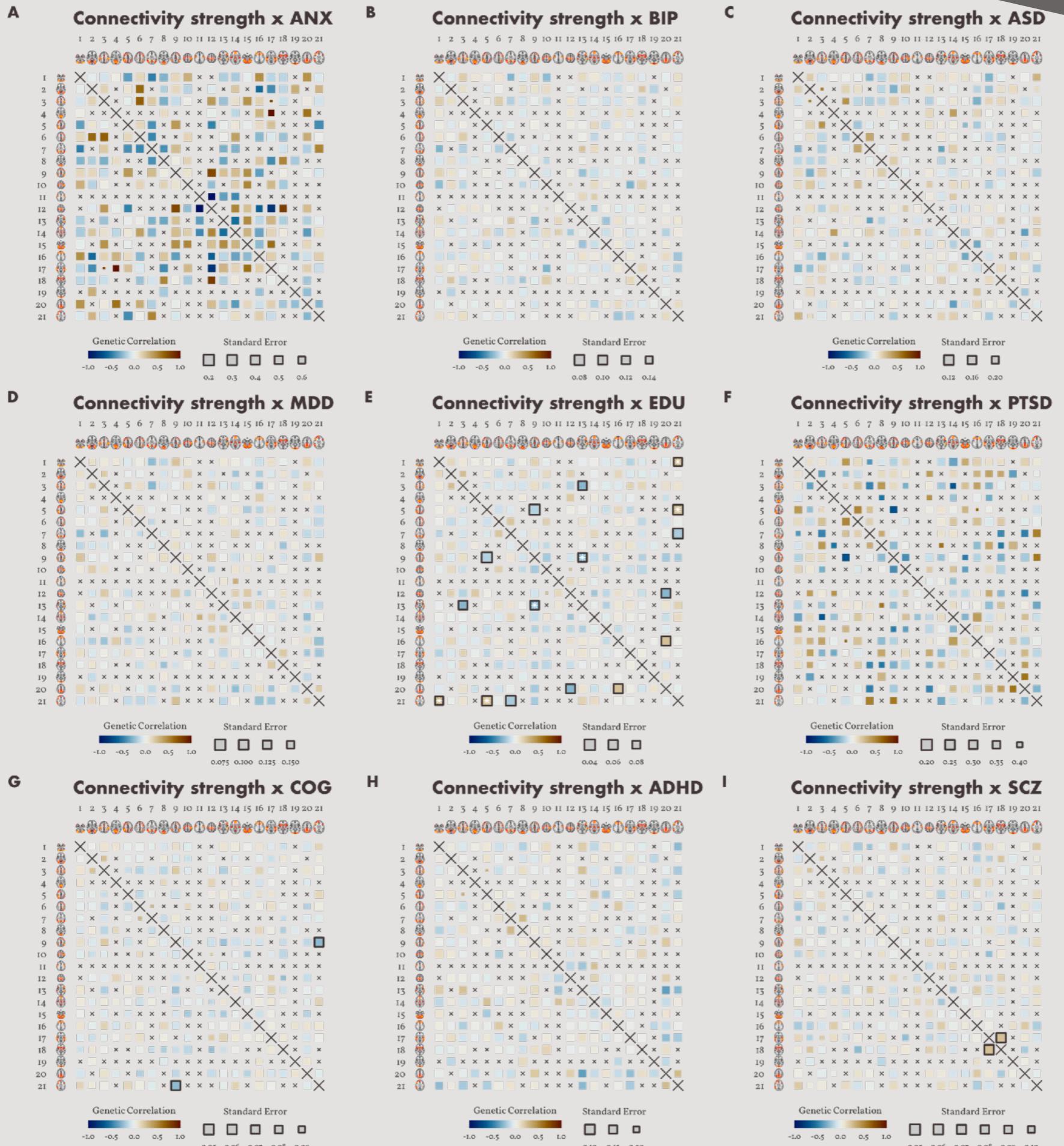
2I x node variance

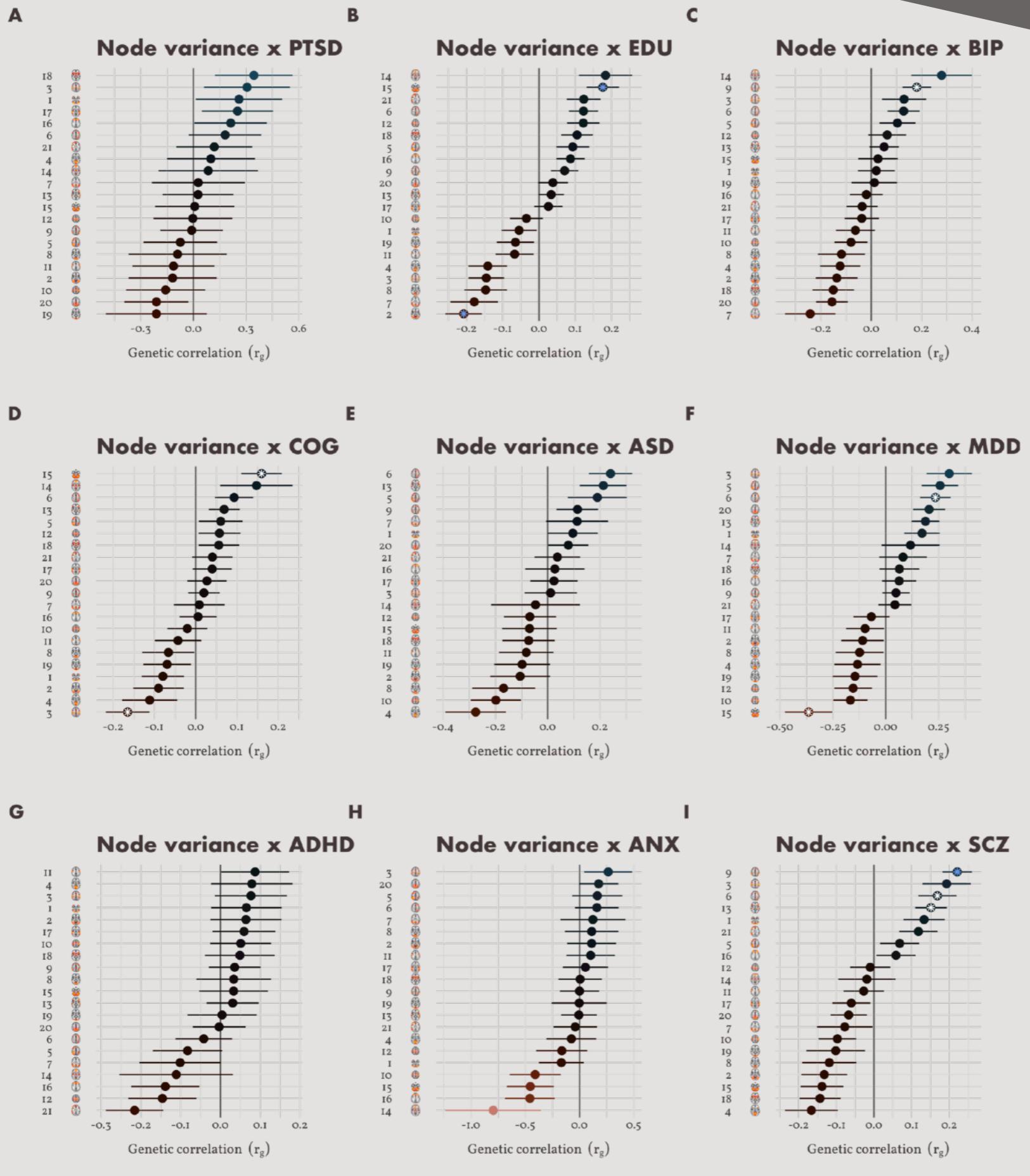


Genetic correlation

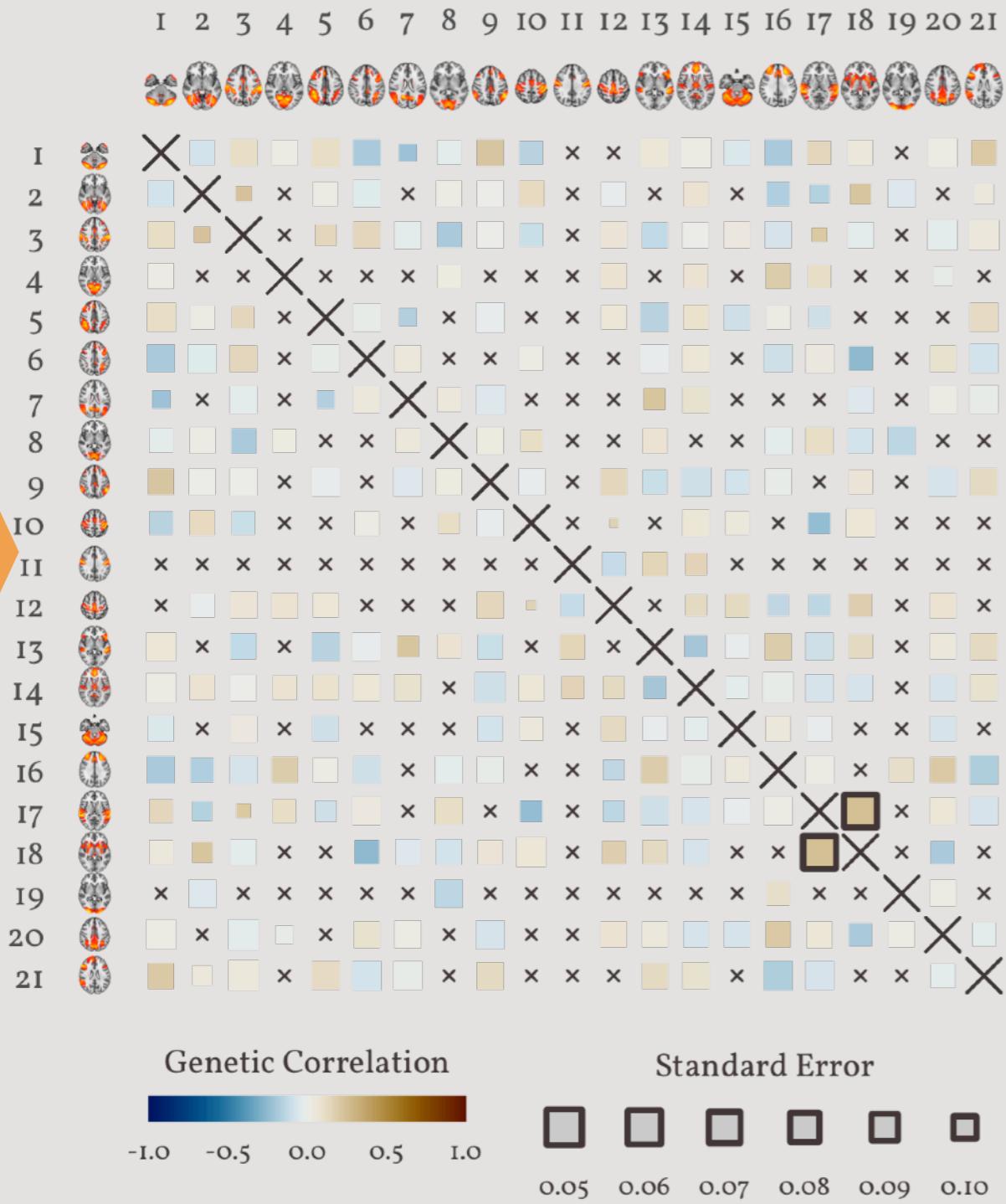
Identify genetic links between fMRI features and psychiatric disorders and cognitive traits

So...
Many...
Correlations...

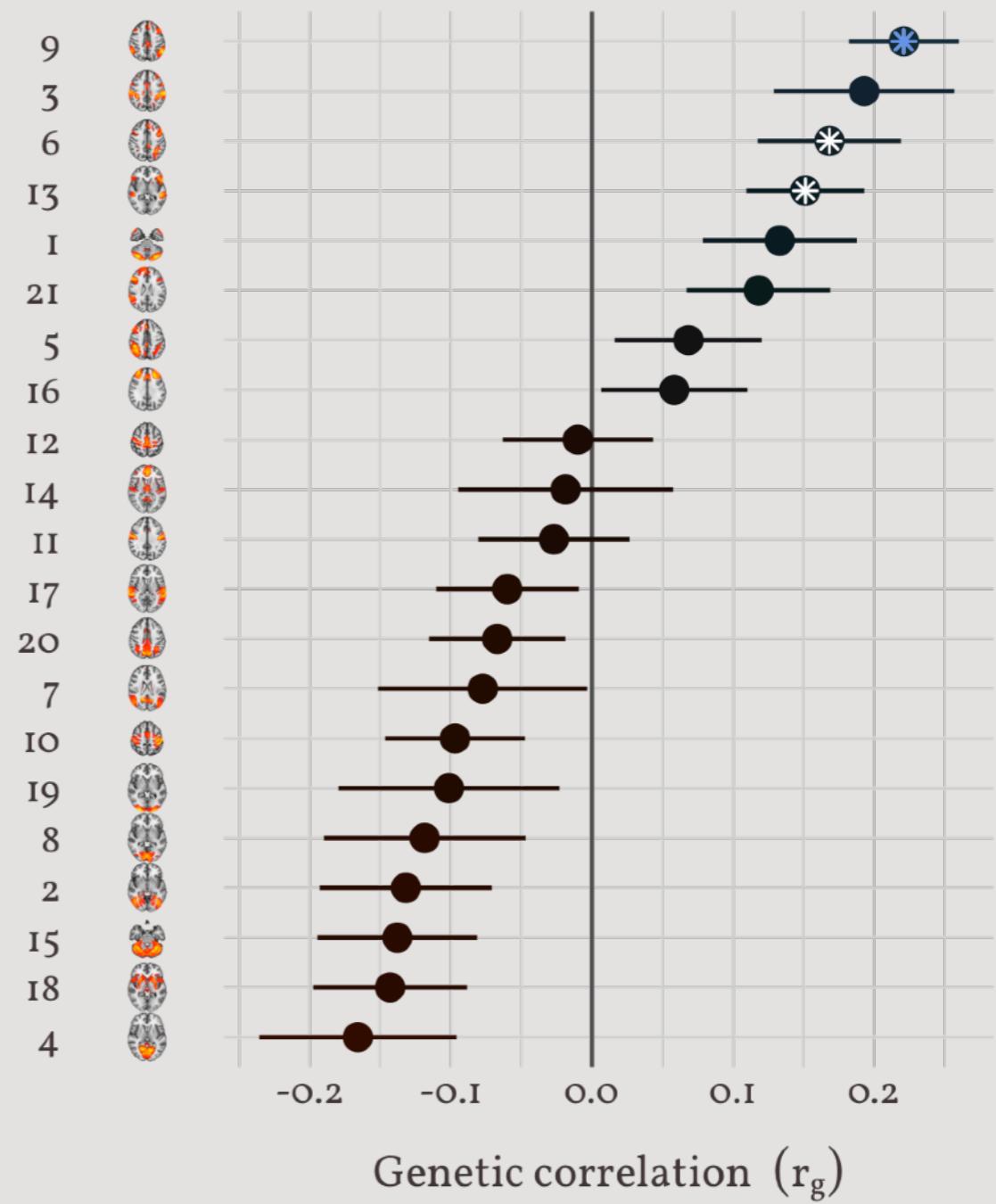




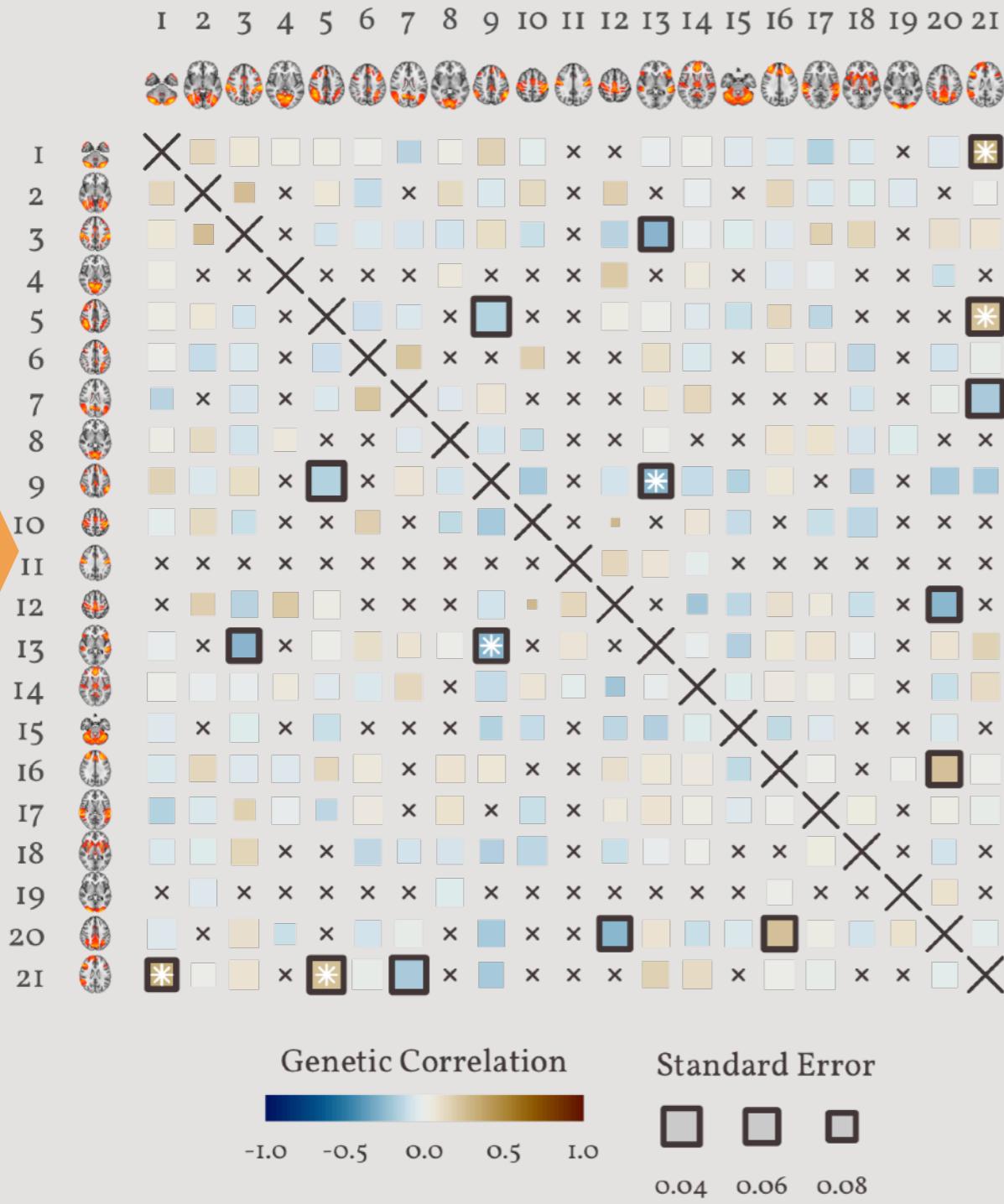
Connectivity strength x SCZ



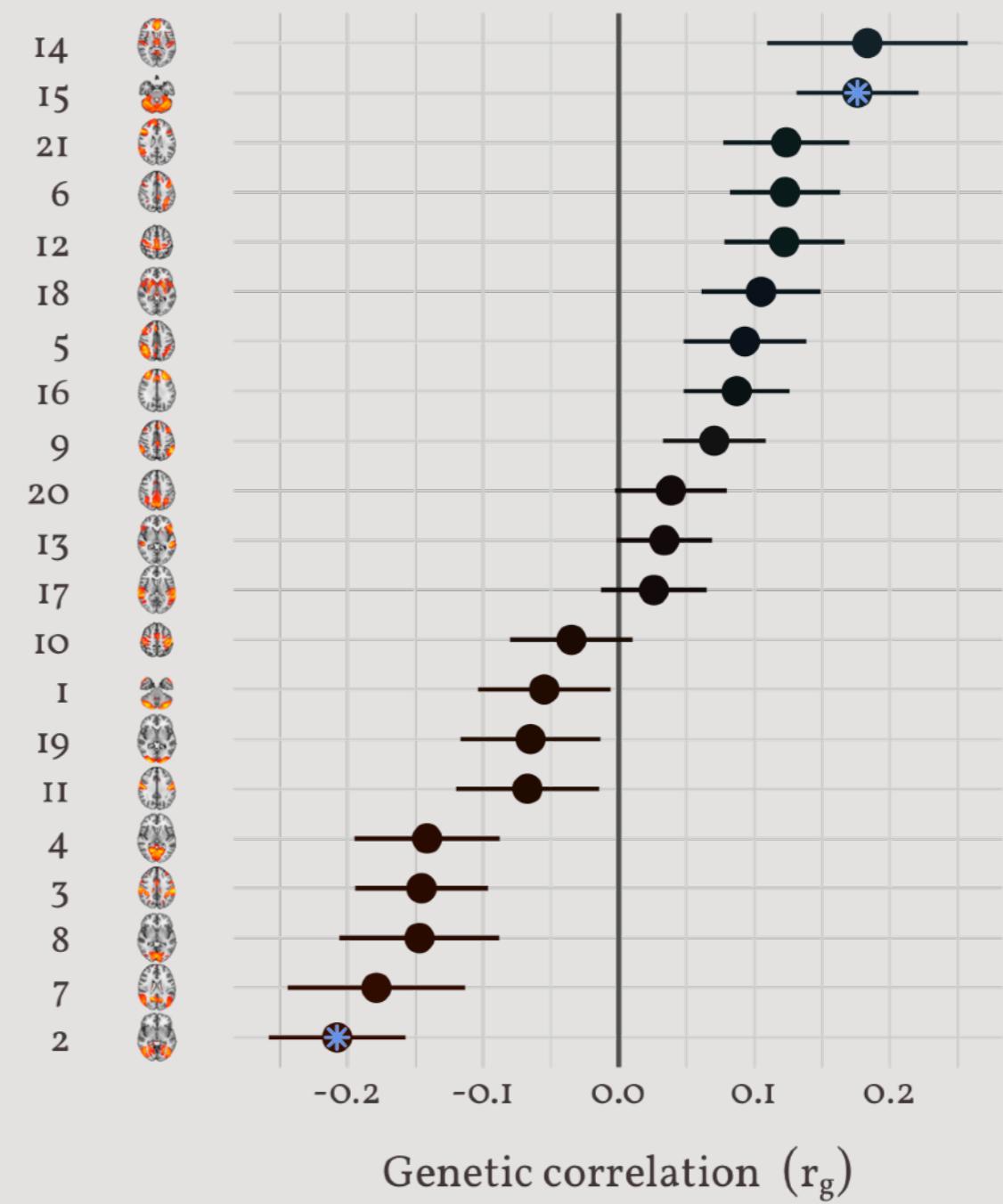
Node variance x SCZ



Connectivity strength x EDU

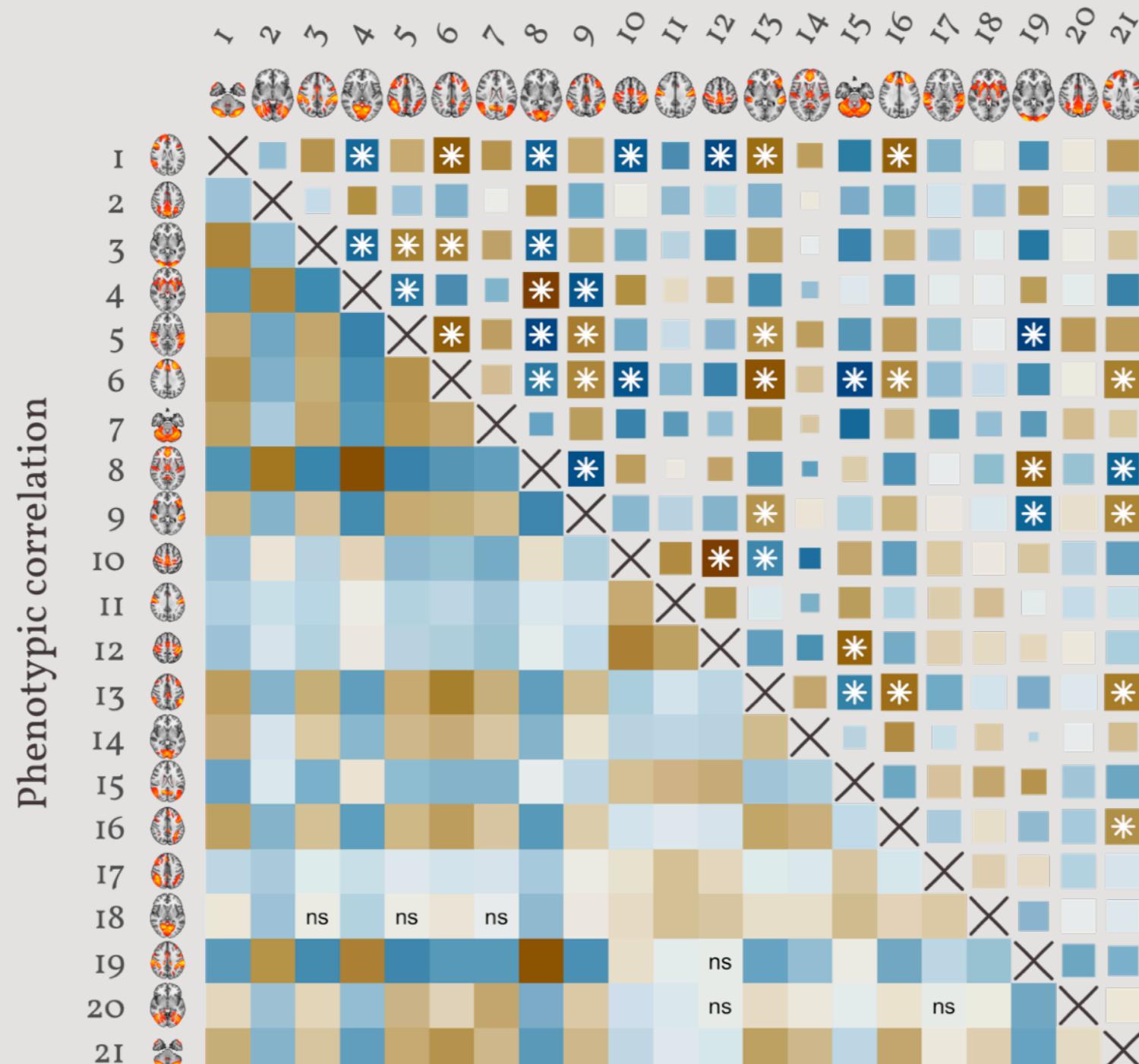


Node variance x EDU



Node variance x node variance

Genetic correlation

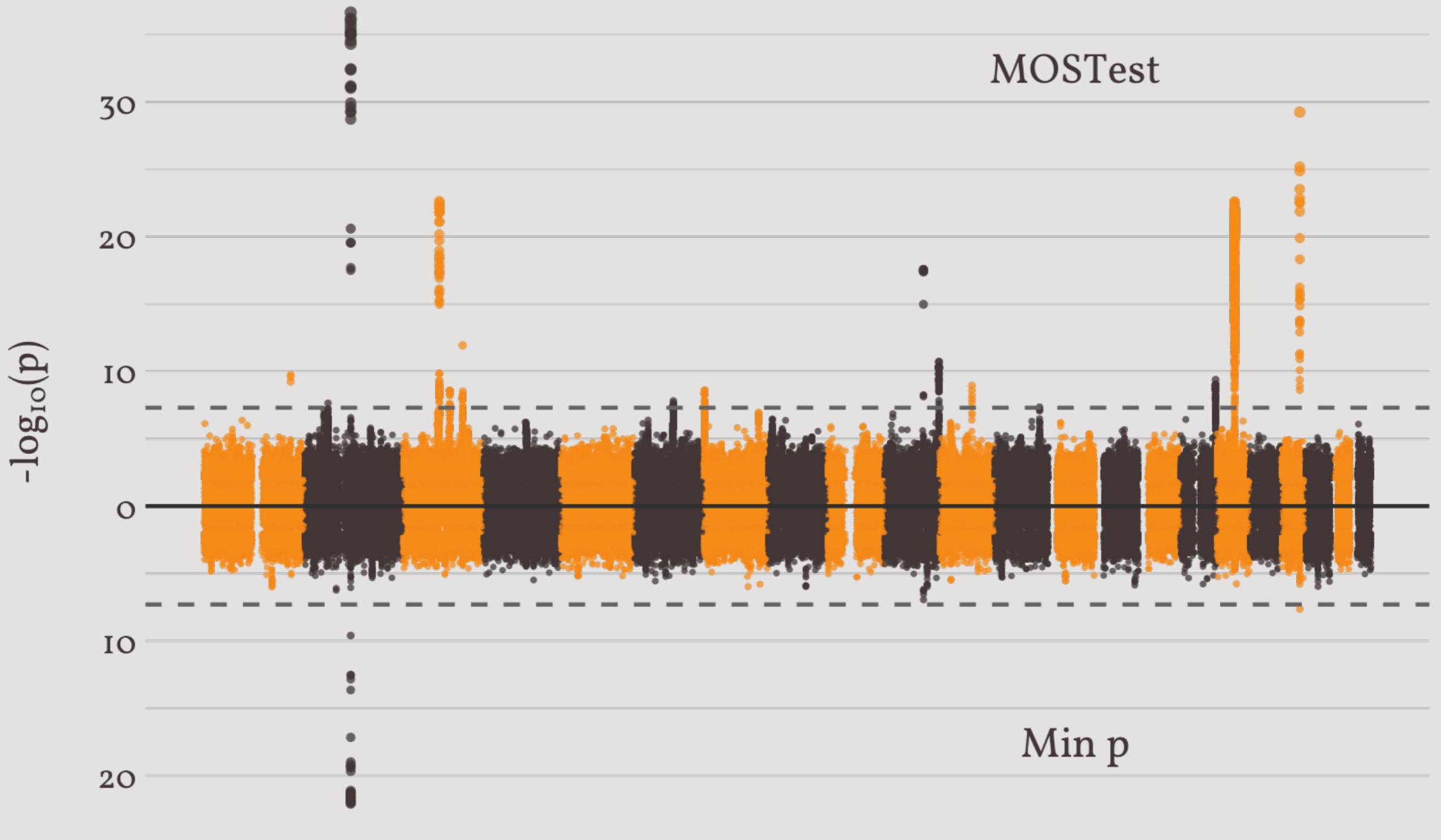


Correlation



Standard Error





Discussion

- Genetic map of the functional connectome
- Helps with SNP discovery
- Can fMRI findings in psychiatry be (partly) due to the genetics of the connections in the brain?
- Identify biological processes associated with both FC and psychiatric traits through functional annotation of genetic loci



Discussion

- Genetic map of the functional connectome
- Helps with SNP discovery
- Can fMRI findings in psychiatry be (partly) due to the genetics of the connections in the brain?
- Identify biological processes associated with both FC and psychiatric traits through functional annotation of genetic loci



Discussion

- Genetic map of the functional connectome
- Helps with SNP discovery
- Can fMRI findings in psychiatry be (partly) due to the genetics of the connections in the brain?
- Identify biological processes associated with both FC and psychiatric traits through functional annotation of genetic loci



Discussion

- Genetic map of the functional connectome
- Helps with SNP discovery
- Can fMRI findings in psychiatry be (partly) due to the genetics of the connections in the brain?
- Identify biological processes associated with both FC and psychiatric traits through functional annotation of genetic loci



Thanks!

