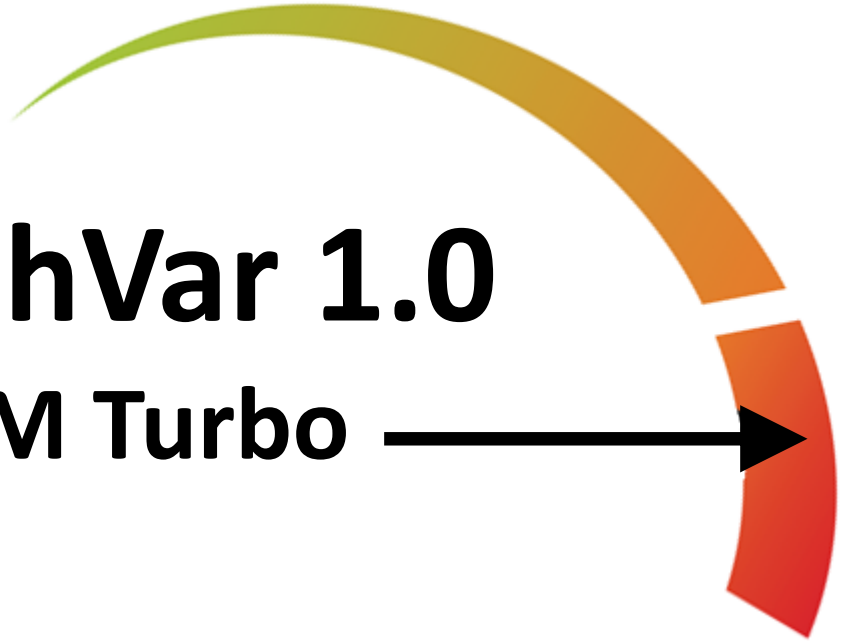
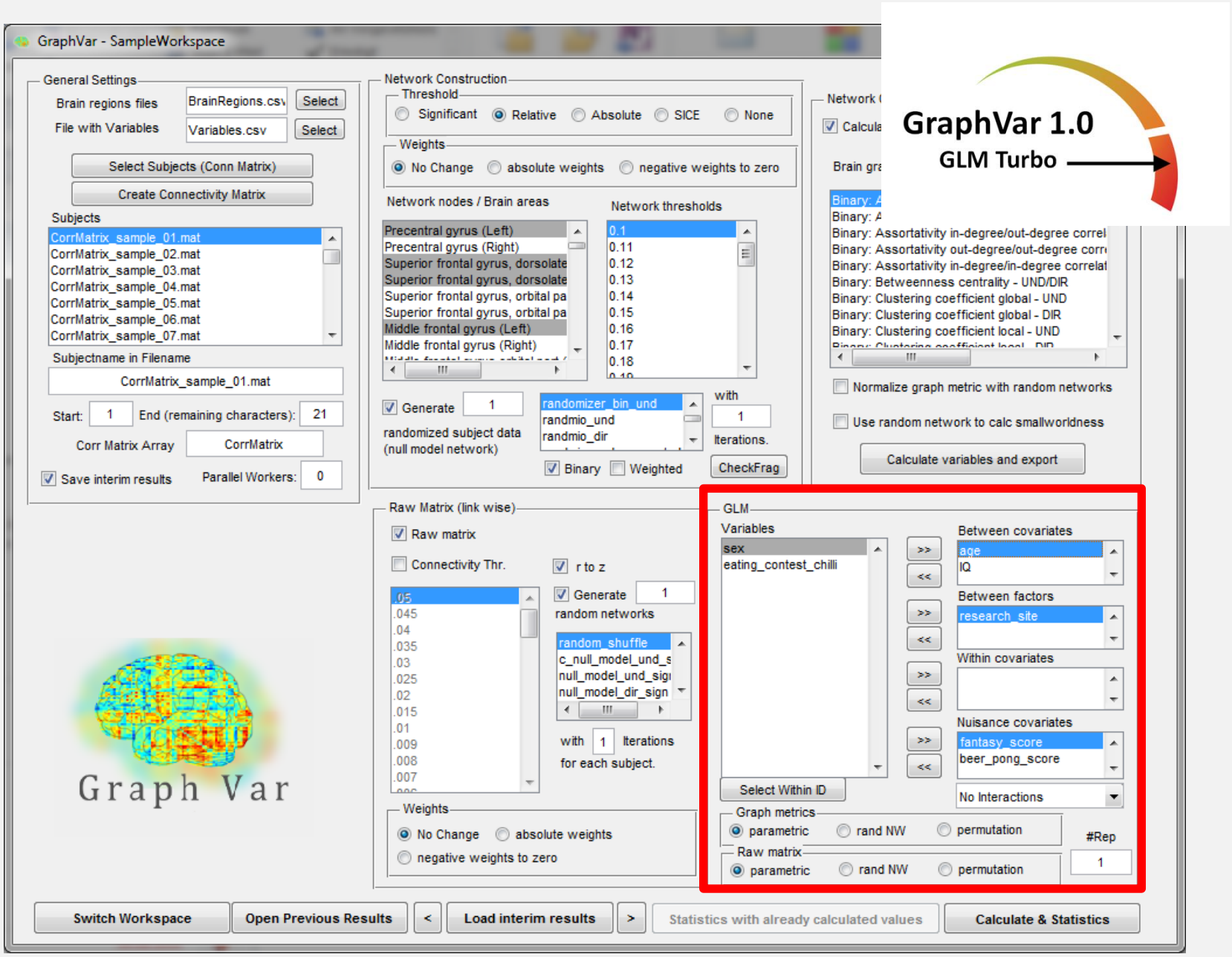
GraphVar 1.0

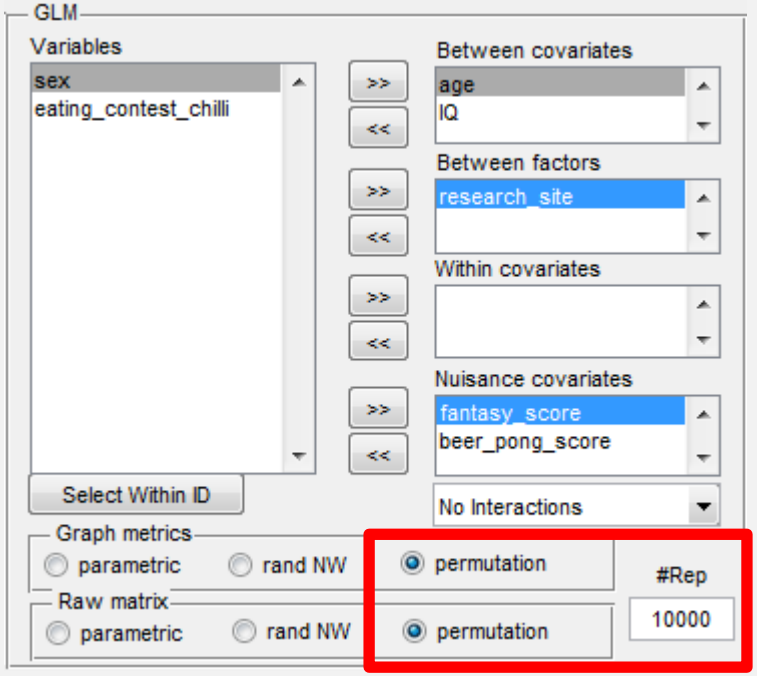
GLM Turbo



NEW FEATURES



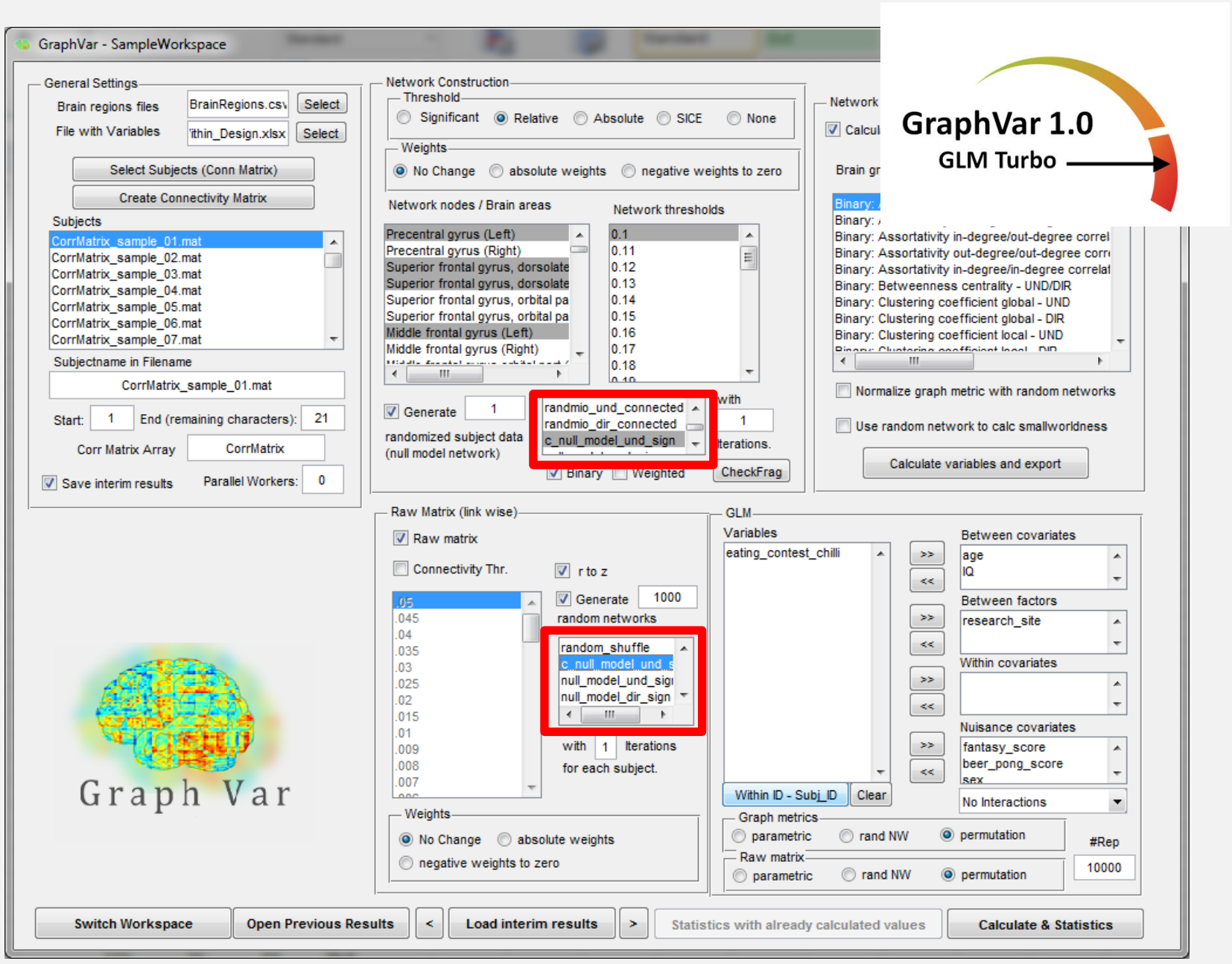
New general linear model (GLM) framework



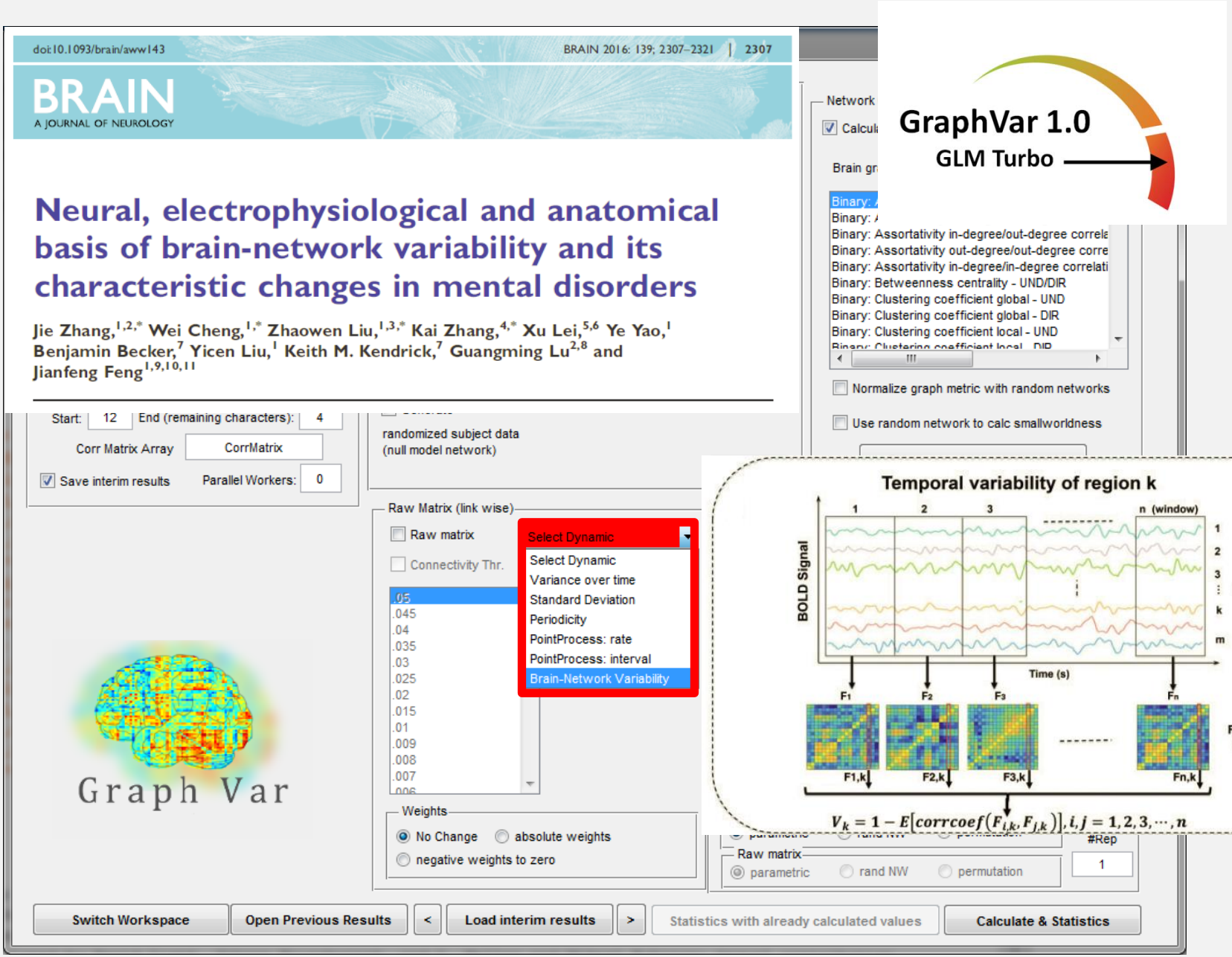
GraphVar calls C++ functions which enable fast permutation testing

-> This feature allows for large-scale non-parametric testing of the connectome (e.g. NBS on the fully connected association matrices)

Fast permutation testing via C++ functions

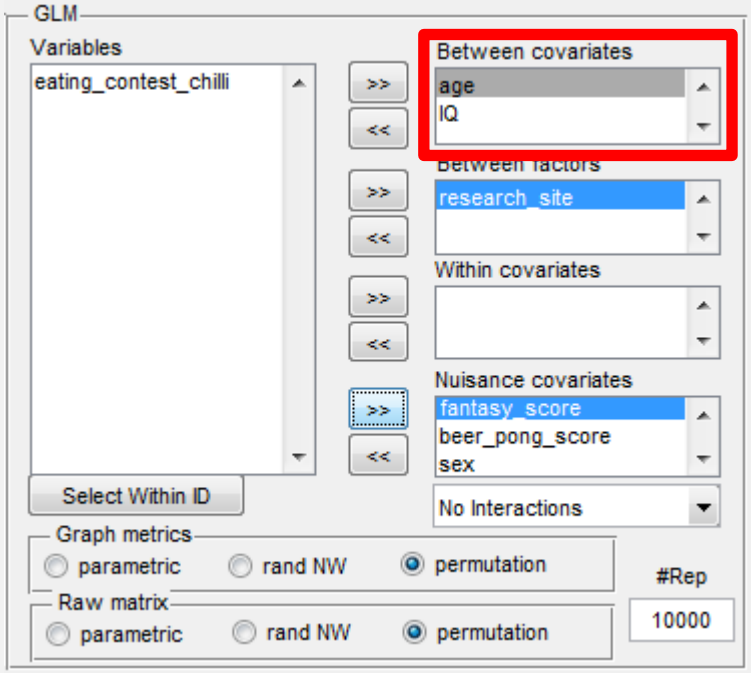


Fast C++ implementation of „null_model_und_sign“



Brain-Network Variability (Zhang et al. 2016)

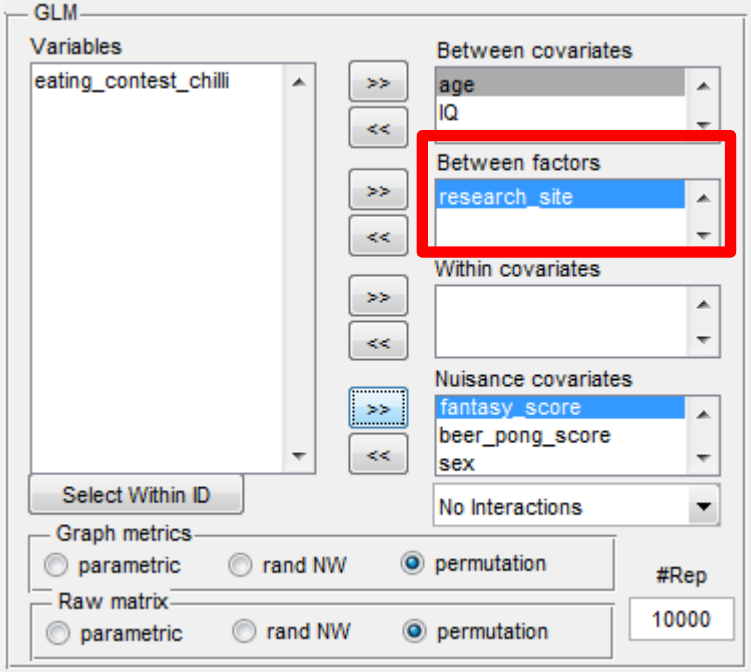
GLM SETUP



Covariates (continuous)

Estimates regression coefficients with regard to the dependent variables. Prior to analysis, the covariates are demeaned to elimiate collinearity with the intercept term

Building the model - Covariates

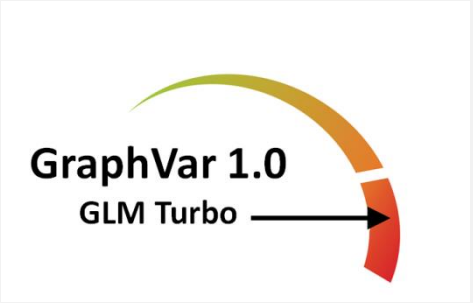


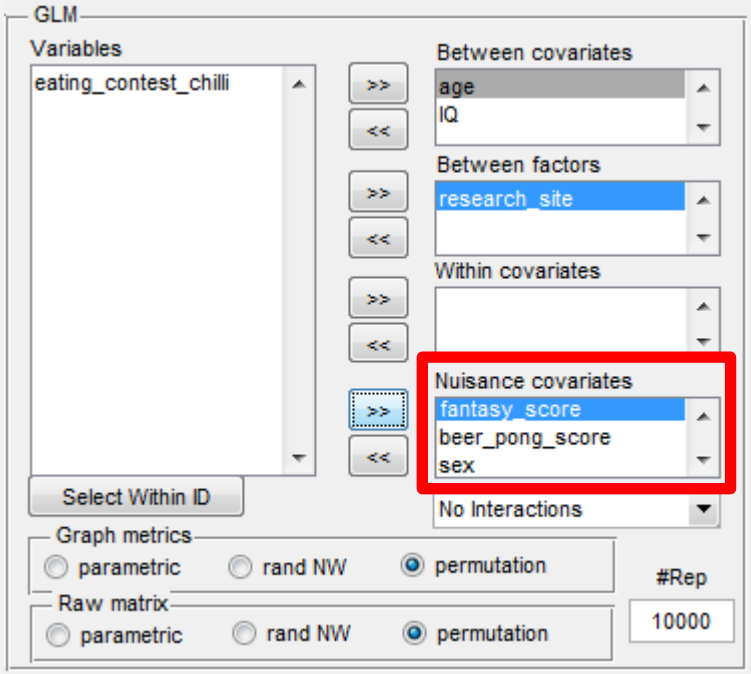
GraphVar 1.0
GLM Turbo

Between factors (categorical)

Estimates the effects of categorical variables, individual group means and pairwise differences between groups.

Building the model – Between factors

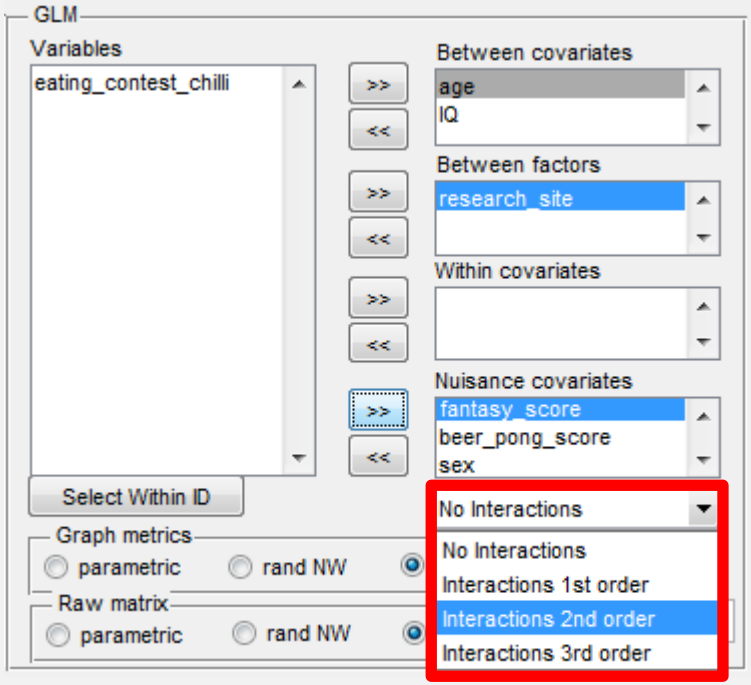




Nuisance covariates

Prior to all analyses, the nuisance covariates are partialled out from the dependent variables.

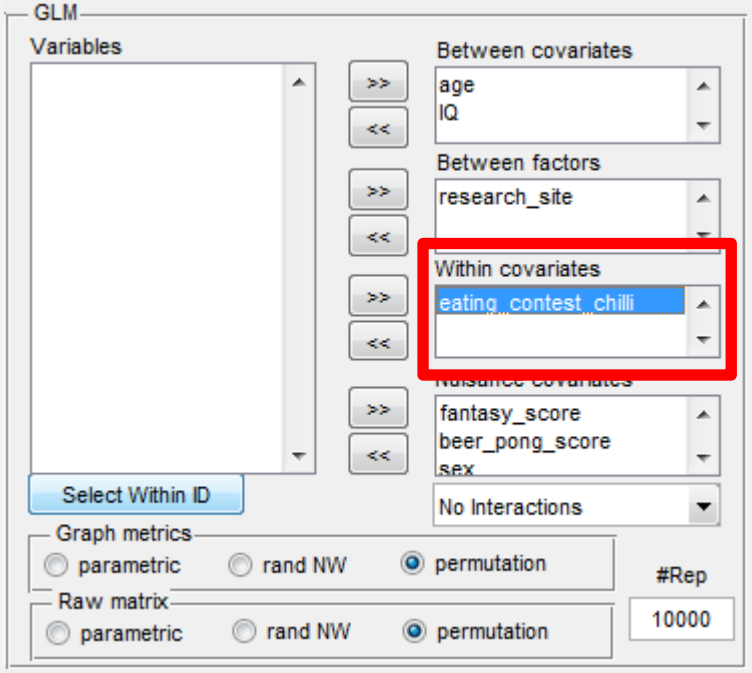
Building the model – Nuisance covariates



Interactions

Allows categorical, continuous and categorical-continuous interactions (i.e., differences in regression weights between groups) up to the 3rd order.

Building the model – Interactions



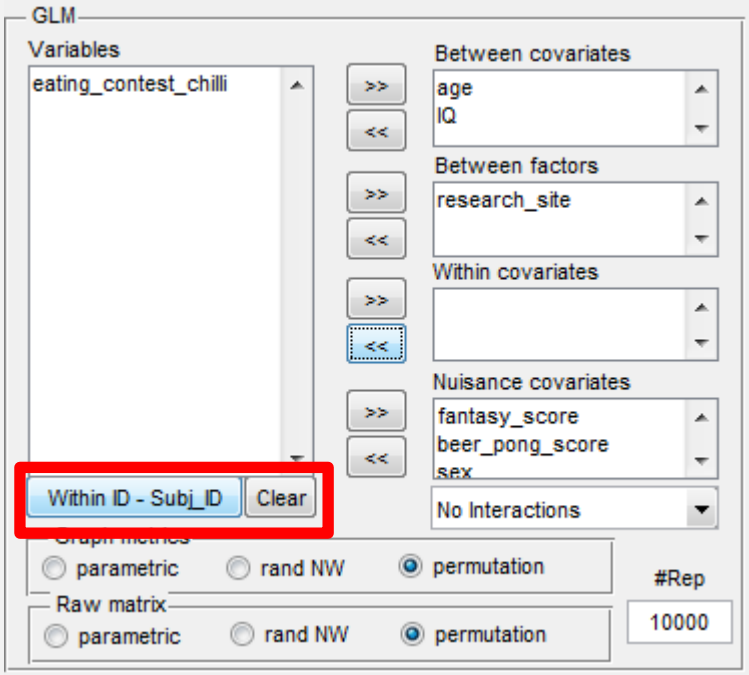
GraphVar 1.0
GLM Turbo

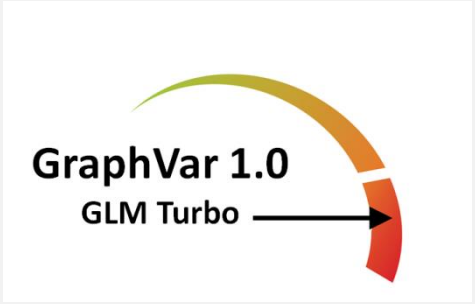
Within covariates *

Estimates regression coefficients in repeated measures analyses with two time points. Prior to analysis, the covariates are demeaned to elimiate collinearity with the intercept term

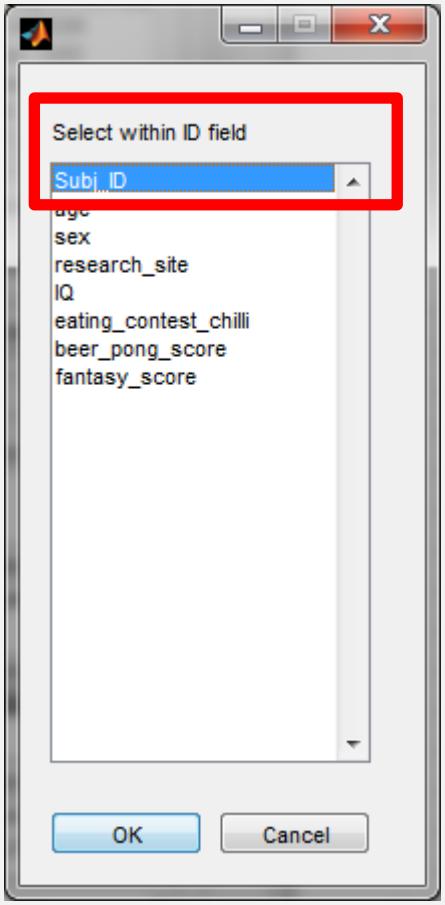
** please refer to the tutorial for how to structure the Variable sheet*

Building the model – Within covariates





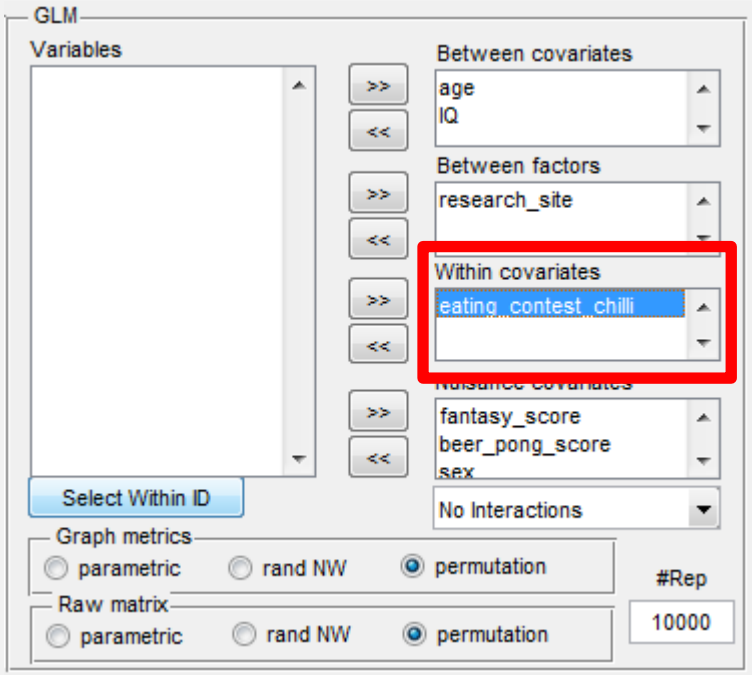
Within covariates field is blank

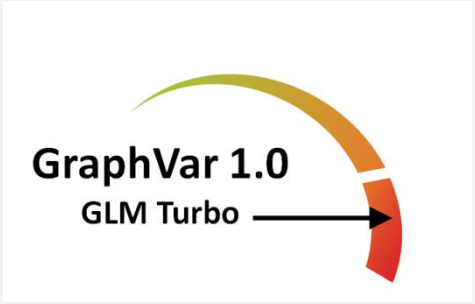


Research option 1 - example:

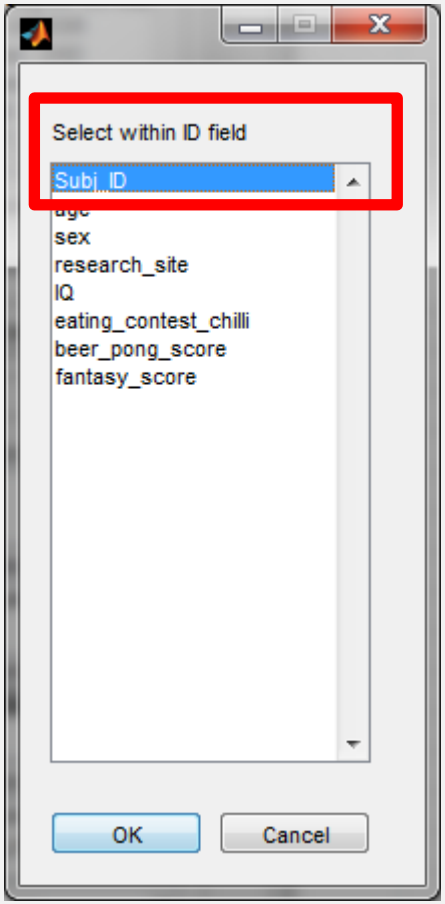
Investigate the association between a constant independent variable (e.g. sex or genotype) and a changing dependent network variable (e.g. efficiency in T1 and T2)

Building the model – Within covariates I





Select the variable that clearly identifies subjects in the two time points

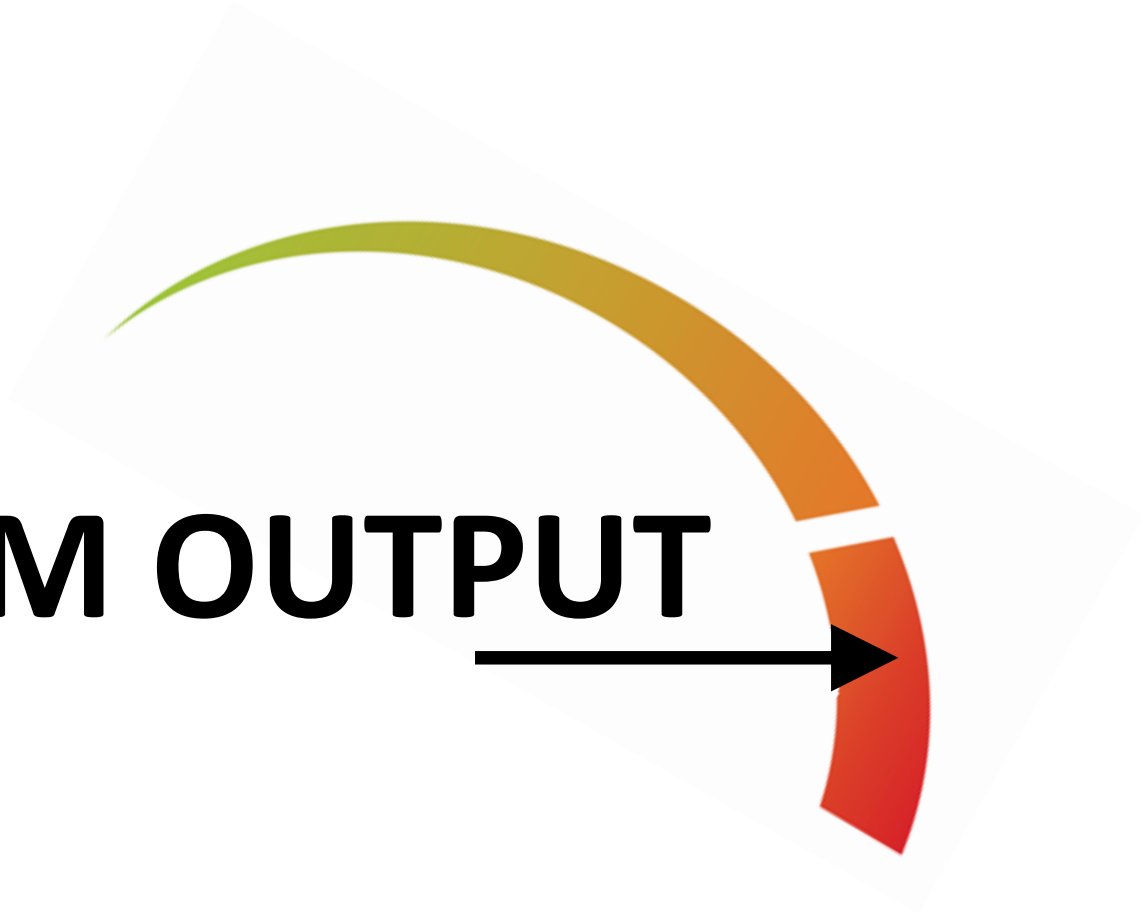


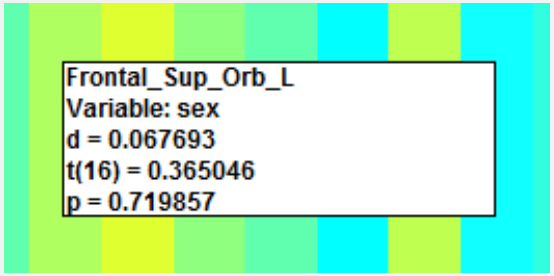
Research option 2 - example:

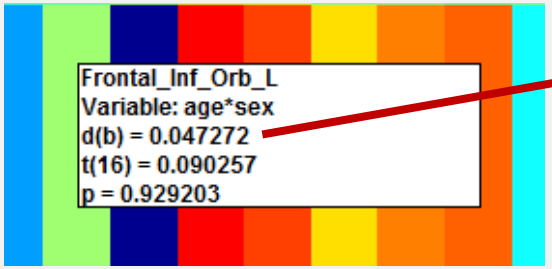
Investigate the association between the change of an independent variable (e.g. cognitive function in T1 and T2) and the change of a dependent network variable (e.g. network efficiency in T1 T2)

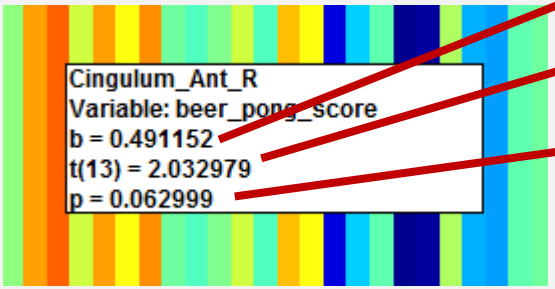
Building the model – Within covariates II

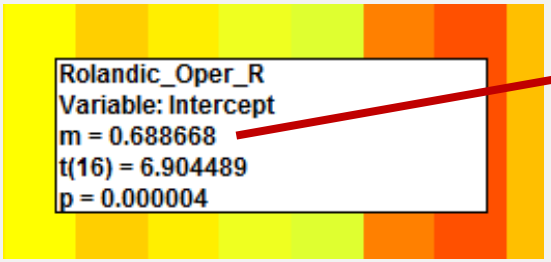
GLM OUTPUT











d: Difference between Group Means

F(df1,df2): F-value

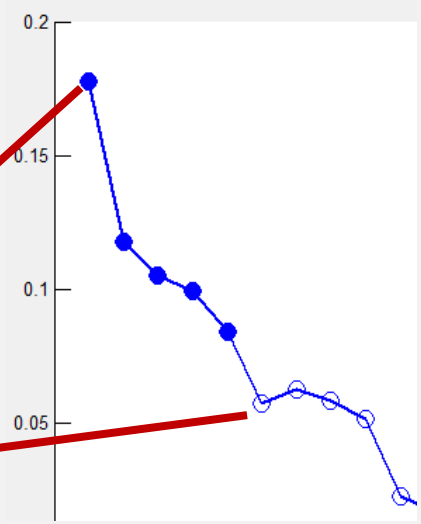
d(b): Difference between Standardized Regression Weights

b: Standardized Regression Weight

t(df): t-Value

p: p-Value

m: Mean



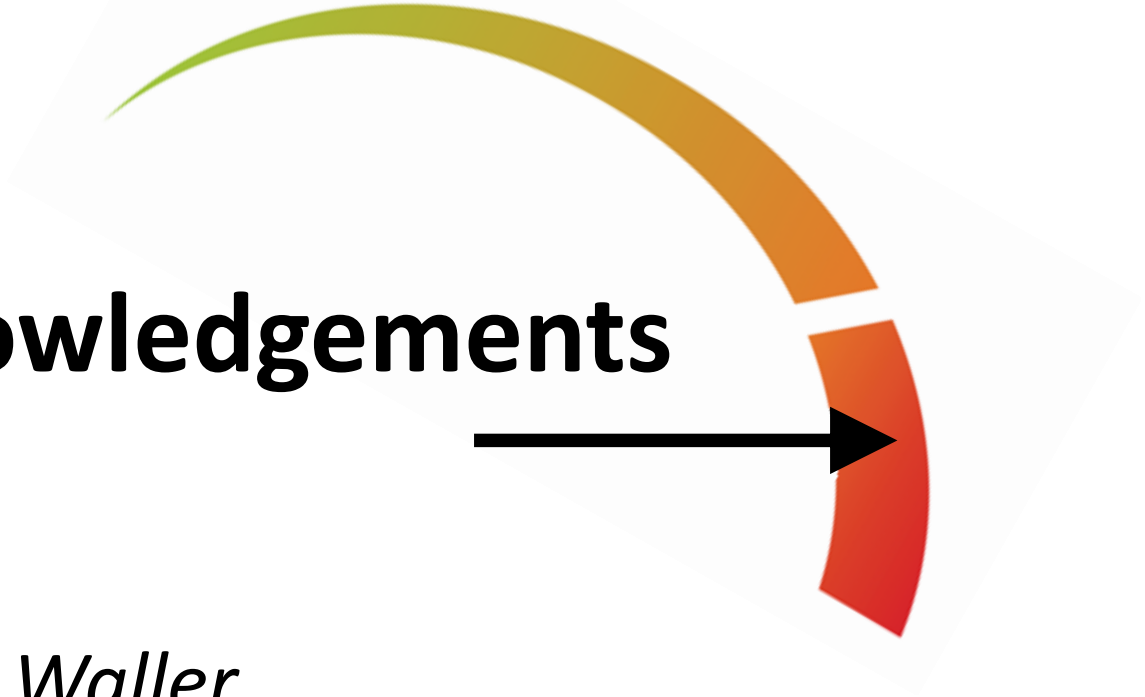
significant

not-significant

Interpreting GraphVar output

GraphVar -Team

Acknowledgements



- GLM – *Lea Waller*
- Brain Network Variability implementation – *Lena Dorfschmidt*
- Testing and coffee – *Johann Kruschwitz, David List*