Negative controls

Brian Caffo, Jeff Leek, Roger Peng

@bcaffo

www.bcaffo.com

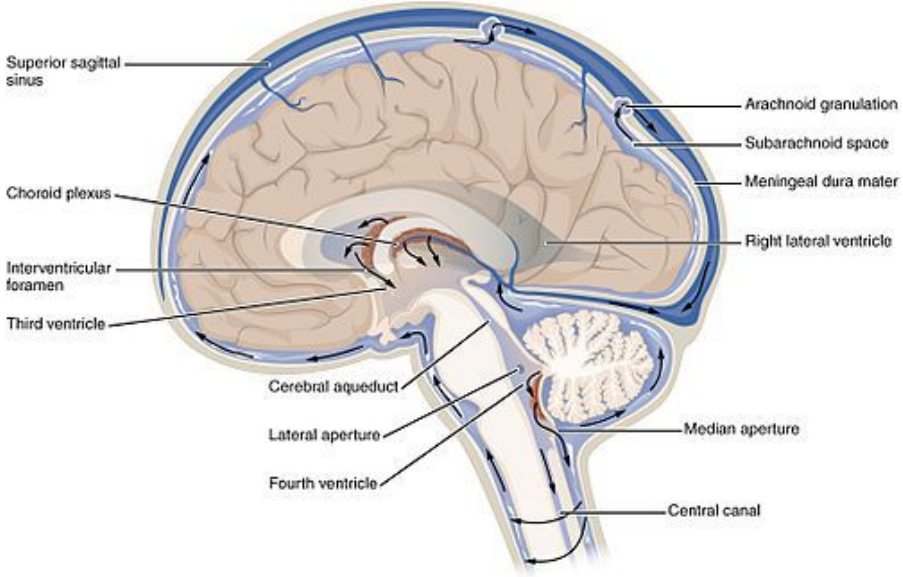
You’re worried that your results are more do to process than real effect.

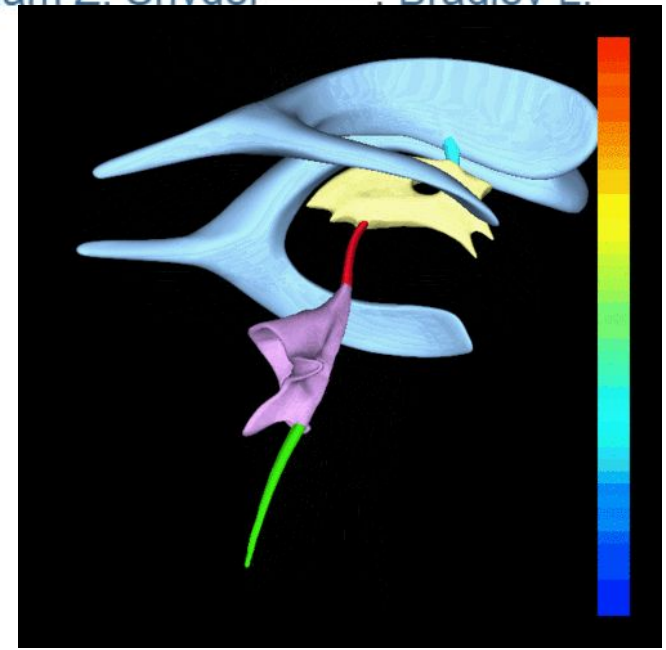
How do you check?

Negative controls - repeating the study for a variable that is known to have no association

Spurious but systematic correlations in functional connectivity MRI networks arise from subject motion

Jonathan D. Power[a,], Kelly A. Barnes[a], Abraham Z. Snyder[a, b], Bradley L. Schlaggar[a, b, c, d], Steven E. Petersen[a, b, d, e]





https://en.wikipedia.org/wiki/Ventricular_system

Negative controls offer a simple way to investigate spurious effects due to thinks like confounding or multiplicity

Good negative controls consider variables that are realistic, but known to have no association

Alternative strategy forces no association by permutation (more advanced and nuanced)