

Current Limitations, Pitfalls & Criticisms

Shortcomings of resting-state functional connectivity

I will focus on the limitations of resting-state functional connectivity related to statistics and data analysis.

- **Identifiability:** many questions that we ask have degenerate *-equally plausible-* answers. For instance many significantly-different brain parcellations are plausible candidates to explain the data. This problem is a significant roadblock to the study of fundamental intrinsic brain organization using rest.
- **Variability:** the functional-connectivity metrics that are used to compare subjects or conditions display uncontrolled test-retest differences, that must be put in perspective with the size of the effects of interest. This variability originates from *i)* confounding signals, *ii)* variable cognitive content of rest, *iii)* estimation noise due to data scarcity at the subject level. It may limit the usefulness of resting-state acquisition to develop bio-markers.