



HAL
open science

Systematic review and evaluation of meta-analysis methods for same data meta-analyses

Jeremy Lefort-Besnard, Thomas E Nichols, Camille Maumet

► To cite this version:

Jeremy Lefort-Besnard, Thomas E Nichols, Camille Maumet. Systematic review and evaluation of meta-analysis methods for same data meta-analyses. Cogbases-2023 - Workshop on open science methods for analyzing brain imaging data, Institut Pasteur, Paris; Parietal team, Inria, Paris Saclay, Oct 2023, Paris, France. pp.1-1. inserm-04222730

HAL Id: inserm-04222730

<https://inserm.hal.science/inserm-04222730v1>

Submitted on 13 Oct 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Title:

Systematic review and evaluation of meta-analysis methods for same data meta-analyses.

Authors :

Jeremy Lefort-Besnard, Thomas Nichols*, Camille Maumet*

**Sharing last authorship*

Abstract:

Researchers using fMRI data have a wide range of analysis tools to model brain activity. This diversity of analytical approaches means there are many possible variations of the same imaging result. Thus, analyzing a dataset with a single approach can be misleading. Alternatively a multiverse analysis can be used, where multiple sets of results are obtained from running different pipelines on the same single dataset. The starting assumption for traditional meta-analyses is the independence among input data. Thus, here, we present “same data meta analysis” methods for examining multiple sets of neuroimaging results derived from a multiverse analysis, accounting for the inter-analysis dependence. The validity of this method is evaluated and compared against established meta-analysis methods, and we demonstrate the method on real world data from “NARPS”, a multiverse analysis with 70 different statistic maps originating from the same data.