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

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**Title:**

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

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**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.