

# DS190 Topic

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My capstone project topic is: Effect of Variations in the Analysis Pipeline on Self-Regulation Related fMRI Correlates. I took a fMRI class and am very interested in investigating pre-processing and data analysis with fMRI for my project. In fMRI analysis, there are multiple steps of raw data preprocessing prior to starting analysis, and the order of preprocessing varies across labs, with different packages (e.g., nipipe, SPM) and different parameters (e.g., Harvard brain atlas, individual parcellation) adopted based on labs' individual preferences (i.e., what they were used to). Recently, there are labs that focus on how these changes would affect the results of fMRI studies, with one of the most influential paper being sending the same dataset and research questions to 17 different groups, and finding an almost even split on whether the hypotheses were supported across groups due to their different analysis pipelines (Botvinik-Nezer et al. 2020). I am interested in exploring this topic further by using a dataset collected by Dr. Zeynep Enkavi that consisted of self-regulation tasks.

## References

Botvinik-Nezer, Rotem, Felix Holzmeister, Colin F. Camerer, Anna Dreber, Juergen Huber, Magnus Johannesson, Michael Kirchler, et al. 2020. "Variability in the Analysis of a Single Neuroimaging Dataset by Many Teams." *Nature* 582 (7810): 84–88. <https://doi.org/10.1038/s41586-020-2314-9>.