Thursday, May 21st, 2020, 2pm ET
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Advancing our understanding of lesion symptom mapping tools: An empirical comparison of univariate versus multivariate methods

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Lesion-symptom mapping tools are widely used to identify the neural structures critical for a given behavior. Some studies have claimed that novel multivariate lesion-symptom mapping methods, that consider the effects of all lesioned voxels on behavior in one model simultaneously, should be superior to traditional univariate approaches, that compare performance serially on a voxel by voxel basis. However, many of these arguments have been presented theoretically without rigorously comparing the two approaches. In my talk I will discuss our current work that aimed to address these knowledge gaps and provide a comprehensive empirical appraisal of several univariate and multivariate methods with a large stroke lesion dataset, using both synthetic and real behavioral data, across a range of relevant parameters. Our results showed no clear superiority of either univariate or multivariate methods overall, as accuracy of methods varied differentially depending on specific conditions. I will conclude by outlining limitations and advantages of different approaches and highlighting methodological implications of our findings for enhancing accuracy and robustness of future lesion-symptom mapping work.

This lecture can be followed online from your computer, tablet or smartphone, via a link that will be provided on the C-STAR website: http://cstar.sc.edu/lecture-series/