Perspectives on Machine Learning for Classification of Schizotypy Using fMRI Data

Functional magnetic resonance imaging is capable of estimating functional activation and connectivity in the human brain, and lately there has been increased interest in the use of these functional modalities combined with machine learning for identification of psychiatric traits. While these methods bear great potential for early diagnosis and better understanding of disease processes, there are wide ranges of processing choices and pitfalls that may severely hamper interpretation and generalization performance unless carefully considered. In this perspective article, we aim to motivate the use of machine learning schizotypy research. To this end, we describe common data processing steps while commenting on best practices and procedures. First, we introduce the important role of schizotypy to motivate the importance of reliable classification, and summarize existing machine learning literature on schizotypy. Then, we describe procedures for extraction of features based on fMRI data, including statistical parametric mapping, parcellation, complex network analysis, and decomposition methods, as well as classification with a special focus on support vector classification and deep learning. We provide more detailed descriptions and software as supplementary material. Finally, we present current challenges in machine learning for classification of schizotypy and comment on future trends and perspectives.

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