Behavioral Significance Modulates Attentional Competition in Frontoparietal Cortex

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Presentation Abstract Summary   A key ability in daily-life behavior is to process currently relevant information while discarding irrelevant one. Natural environments are rich and constantly changing, with many items competing for attention. Here we adapted a paradigm that was previously used in nonhuman primates and used multivariate pattern analysis of fMRI data to test for the effects of behavioral significance on attentional competition in the human brain. We used a cued-detection categorization task that included multiple items presented simultaneously. We manipulated the behavioral significance of the items and measured the similarity of the voxelwise patterns of the multiple-item displays to its constituent items. In frontoparietal cortex, both targets and distractors dominated the response patterns. Distractors that were more behaviorally significant had stronger representation in the overall pattern and competed more for attention than distractors that were less relevant. These modulations were not evident in a high visual region, the lateral occipital complex. These findings emphasize the role of frontoparietal cortex in prioritizing information depending on its behavioral relevance to support adaptive goal-directed behavior.

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