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Feature-Based Information Filtering in Visual Working Memory is impaired in Parkinson's Disease

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Abstract

Increasing attention has been given to working memory (WM) impairment in Parkinson's disease (PD) patients. Previous studies revealed that the *space*-orientated feature-based filtering (target and distractors in distinct locations) was impaired in PD patients. However, the *object*-orientated feature-based filtering (target and distractor information pertaining to one object) ability in PD patients remains unclear. In this study, we examined the *object*-orientated feature-based filtering ability of 14 PD patients and 14 healthy controls in a change detection task under EEG monitoring. Participants were asked to remember the colors of two different objects while ignoring their shapes. Critically, the irrelevant feature could be changed in the probe. A failure in complete feature-based filtering would lead to an "irrelevant-change distracting effect," where the change of the irrelevant feature would impair the performance of the target feature, and lead to an enhanced anterior N2. We found that the distracting effect was larger in PD patients than in the control group in terms of d' ; however, the N2 amplitude evoked by the irrelevant change was smaller in PD patients than in the control group. These results suggested that the *object*-orientated feature-based filtering ability was impaired in PD, which might derive from the deficit of their executive control.

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