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Sad and fearful face distractors do not consume working memory resources in depressed adults

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Abstract

Previous studies have shown that task-irrelevant threatening faces (e.g., fearful faces) are difficult to filter from visual working memory (VWM). Depressive symptoms could also potentially affect the ability to filter different emotional faces. What is not known, however, is whether non-threatening negative faces (e.g., sad faces) are also difficult to filter and whether depressive symptoms affect filtering ability. We used a color-change detection task to test whether task-irrelevant sad and fearful faces could be filtered by healthy participants and by depressed participants. The VWM storage of distractors was indicated by contralateral delay activity, a specific event-related potential index for the number of objects stored in VWM during the maintenance phase. The healthy group stored the same amount of VWM information under the non-distractor and the sad face distractor conditions, but more information was stored under the fearful face distractor condition than under the other conditions (non-distractor condition and sad face distractor condition), suggesting that specifically threatening faces are difficult to filter from VWM in healthy individuals. By contrast, depressed participants stored the same amount of VWM information under the non-distractor condition, fearful face distractor condition, and sad face distractor condition, suggesting no extra consumption of VWM resources for both fearful and sad face distractors. That is, a greater number of depressive symptoms seems to enhance the filtering ability of irrelevant sad and fearful face distractors from VWM. Our results for healthy participants confirm the previous findings of a threat-related filtering difficulty in average individuals. In addition, our findings suggest that sad and fearful faces do not unnecessarily load the VWM. The novel finding of the absent storing of negative distractors in VWM in participants with depressive symptoms may reflect a decreased overall responsiveness to negative facial stimuli. Future studies should investigate the mechanisms underlying distractor filtering in depressed populations.