Capacity Limits of Working Memory: The Impact of Multitasking on Cognitive Control and Emotion Recognition in the Adolescent Mind

Ulmer, Alexandra

Caulfield, Sarayu

Media multitasking is increasingly prevalent in our society, especially among the young. Processing multiple streams of information simultaneously, however, is cognitively challenging, thereby potentially causing reduced effectiveness in the performance of the overlapping tasks. Working memory is the brain function responsible for setting priorities for tasks and limiting distraction. This study examines the effects of habitual and active multitasking on the performance of working memory and its ability to switch between tasks and filter out distractions. 403 participants were randomly assigned to either a multitasking or non-multitasking room; both groups completed a standardized questionnaire used to calculate their multitasking index score, tests to assess the participants' ability to juggle tasks and focus (AX-CPT), and to assess emotion recognition (DANVA2). Participants in the multitasking room completed these studies simultaneously with additional auditory, visual, and cognitive tasks. A Media Multitasking Index was used to identify groups of high and media multitaskers. The results of this investigation suggest that the pattern of media use is reflected in the performance of the individual's ability to switch between tasks, filter irrelevant information, and multitask. Those with habitual high use of multiple media were better able to filter out distracting irrelevant tasks (75.5 v 66.1, $p = 0.014$), but surprisingly performed worse when they were not pursuing multiple tasks. In other words, they were better at multitasking, but performed worse when made to focus. Those with habitual low use of multiple media were less able to filter out interference from distracting tasks, but were best able to focus on single tasks (16.9 v 9.8, $p < 0.0001$).

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