

# Dynamic, continuous multitasking training leads to task-specific improvements but does not transfer across action selection tasks

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*npj Science of Learning*

**volume 2**, Article number: 14 (2017)

doi:10.1038/s41539-017-0015-4

## Abstract

The ability to perform multiple tasks concurrently is an ever-increasing requirement in our information-rich world. Despite this, multitasking typically compromises performance due to the processing limitations associated with cognitive control and decision-making. While intensive dual-task training is known to improve multitasking performance, only limited evidence suggests that training-related performance benefits can transfer to untrained tasks that share overlapping processes. In the real world, however, coordinating and selecting several responses within close temporal proximity will often occur in high-interference environments. Over the last decade, there have been notable reports that training on video action games that require dynamic multitasking in a demanding environment can lead to transfer effects on aspects of cognition such as attention and working memory. Here, we asked whether continuous and dynamic multitasking training extends benefits to tasks that are theoretically related to the trained tasks. To examine this issue, we asked a group of participants to train on a combined continuous visuomotor tracking task and a perceptual discrimination task for six sessions, while an active control group practiced the component tasks in isolation. A battery of tests measuring response selection, response inhibition, and spatial attention was administered before and immediately after training to investigate transfer. Multitasking training resulted in substantial, task-specific gains in dual-task ability, but there was no evidence that these benefits generalized to other action control tasks. The findings suggest that training on a combined visuomotor tracking and discrimination task results in task-specific benefits but provides no additional value for untrained action selection tasks.