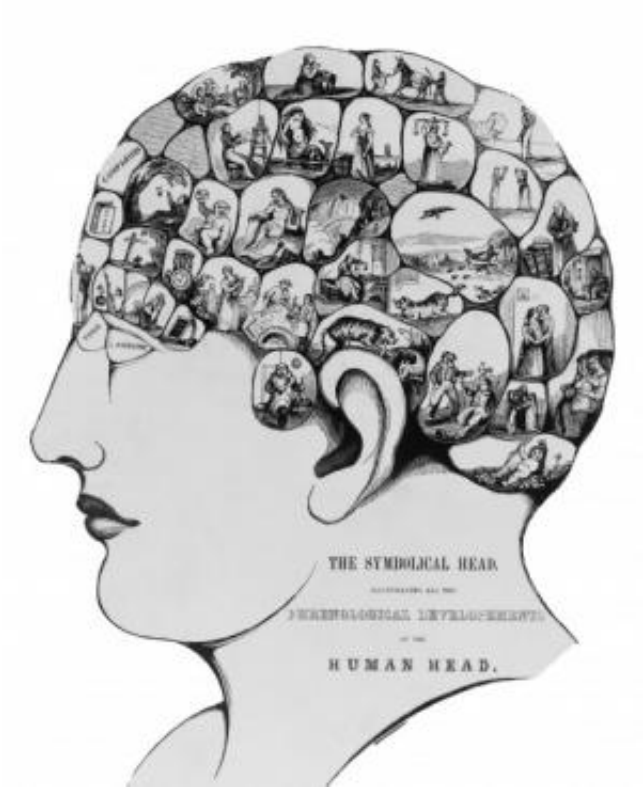
Training found to cause the brain to be better at multitasking

October 13 2015, by Bob Yirka



Credit: Karen Arnold/Public Domain

(Medical Xpress)—A pair of researchers with the University of Queensland has found via a study that involved testing volunteers, that it is possible to teach the brain to be better at multitasking—at least in one instance. In their paper published in *Proceedings of the National Academy of Sciences*, Paul Dux and Kelly Garner describe the

experiments they carried out and what they believe it might mean for the future of developing ways to improve multitasking skills in people.

Despite many claims to the contrary, people are not very good at multitasking—prior research has shown that trying to do so results in lower efficiency. But that presents a fundamental problem for brain scientists—with such a large and powerful brain, why are we only good at taking on one task at a time? To perhaps gather some clues, the research pair enlisted the assistance of 100 volunteers, each of whom was asked to perform two specific tasks while having their brains watched by an fMRI machine.

One of the tasks was to listen for a tone and then to depress a button depending on which sound they heard; the other task consisted of pushing a button when presented with a certain shape. Thus, one task was audio, the other visual. Volunteers were asked to carry out the tasks together, as a constant stream to test their multitasking skills. Another experiment involved training one group of volunteers for five days on the same multitasking exercise, while another group was trained on a different task and then seeing how they compared against each other.

In studying their results, the researchers found that the group that was given training outperformed the group that did not, suggesting that it is possible to improve multitasking abilities, at least for a given pair of tasks. The brain scans also revealed how the improvements came about—the brains of those that had been trained showed compartmentalization of tasks, as indicated by the amount of brain activity occurring for each exercise—the brains had learned to deal with each task separately.

The researchers acknowledge that their study does not indicate that such training would improve multitasking abilities in general, though surely others will use the same sort of techniques to find out if it does.

Developing such a technique could prove to be very valuable in a modern world filled with people attempting to do a lot of things at once.

More information: Training conquers multitasking costs by dividing task representations in the frontoparietal-subcortical system, K. G. Garner, DOI: 10.1073/pnas.1511423112

Abstract

Negotiating the information-rich sensory world often requires the concurrent management of multiple tasks. Despite this requirement, humans are thought to be poor at multitasking because of the processing limitations of frontoparietal and subcortical (FP-SC) brain regions. Although training is known to improve multitasking performance, it is unknown how the FP-SC system functionally changes to support improved multitasking. To address this question, we characterized the FP-SC changes that predict training outcomes using an individual differences approach. Participants (n = 100) performed single and multiple tasks in pre- and posttraining magnetic resonance imaging (fMRI) sessions interspersed by either a multitasking or an active-control training regimen. Multivoxel pattern analyses (MVPA) revealed that training induced multitasking improvements were predicted by divergence in the FP-SC blood oxygen level-dependent (BOLD) response patterns to the trained tasks. Importantly, this finding was only observed for participants who completed training on the component (single) tasks and their combination (multitask) and not for the control group. Therefore, the FP-SC system supports multitasking behavior by segregating constituent task representations.