

Research shows strategic thinking strengthens intellectual capacity

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Credit: Rice University

Strategy-based cognitive training has the potential to enhance cognitive performance and spill over to real-life benefit according to a data-driven perspective article by the Center for BrainHealth at The University of Texas at Dallas published in the open-access journal *Frontiers in Systems Neuroscience*. The research-based perspective highlights cognitive, neural and real-life changes measured in randomized clinical trials that compared a gist-reasoning strategy-training program to memory training in populations ranging from teenagers to healthy older adults, individuals with brain injury to those at-risk for Alzheimer's disease.

"Our brains are wired to be inspired," said Dr. Sandra Bond Chapman, founder and chief director of the Center for BrainHealth and Dee Wylie Distinguished University Chair at The University of Texas at Dallas.

"One of the key differences in our studies from other interventional research aimed at improving [cognitive abilities](#) is that we did not focus on specific cognitive functions such as speed of processing, memory, or learning isolated new skills. Instead, the gist reasoning training program encouraged use of a common set of multi-dimensional thinking strategies to synthesize information and elimination of toxic habits that impair efficient brain performance."

The training across the studies was short, ranging from 8 to 12 sessions delivered over one to two months in 45 to 60 minute time periods. The protocol focused on three cognitive strategies—strategic attention, integrated reasoning and innovation. These strategies are hierarchical in nature and can be broadly applied to most complex daily life mental activities.

At a basic level, research participants were encouraged to filter competing information that is irrelevant and focus only on important information. At more advanced levels, participants were instructed to generate interpretations, themes or generalized statements from information they were wanting or needing to read, for example. Each

strategy built on previous strategies and research participants were challenged to integrate all steps when tackling mental activities both inside and outside of training.

"Cognitive gains were documented in trained areas such as abstracting, reasoning, and innovating," said Chapman. "And benefits also spilled over to untrained areas such as memory for facts, planning, and problem solving. What's exciting about this work is that in randomized trials comparing gist reasoning training to [memory training](#), we found that it was not learning new information that engaged widespread brain networks and elevated cognitive performance, but rather actually deeper processing of information and using that information in new ways that augmented brain performance.

Strengthening intellectual capacity is no longer science fiction; what used to seem improbable is now in the realm of reality."

Positive physical changes within the brain and cognitive improvement across populations in response to strategy-based mental training demonstrate the neuro-regenerative potential of the brain.

"The ability to recognize, synthesize and create the essence of complex ideas and problems to solve are fundamental skills for academic, occupational and real-life success," Chapman said. "The capacity to enhance cognition and complex neural networks in health, after injury or disease diagnosis will have major implications to preventing, diagnosing and treating cognitive decline and enhancing [cognitive performance](#) in youth to prepare them for an unknown future and in middle age to older adults who want to remain mentally robust."

Provided by University of Texas at Dallas

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