

Cognitive training in young and old adults

Transfer, long-term effects, and predictors of gain

Petra Sandberg

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Author
Petra Sandberg

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Abstract

Aging, also in the absence of pathological conditions, is associated with cognitive decline, especially in so called fluid abilities, such as episodic memory and executive functions. This focus of this thesis is cognitive training interventions, which is studied from several perspectives.

In Study I, the aim was to investigate the extent to which executive functions can be strengthened by training in younger and older adults, and to which degree such training generalize to other measures of cognition. Although a large body of research has been investigating training of working memory and executive functions in recent years, the results are diverse. Few have been targeting executive functions broadly with training programs based on theoretical models of executive functions. Study I showed that despite a broad training focus on executive processes, it did not lead to transfer beyond the very near in old adults. The younger however showed transfer effects to measures of working memory.

In Study II, the focus was on studying how the training and transfer effects survive across time. There is limited knowledge about long-term effects of process-based training and age-effects thereof, and the results showed that the training effect was stable after 1.5 years, while only the nearest transfer effect was still significant in both younger and older adults.

Study III focused on individual factors affecting gain and maintenance thereof in a sample of older individuals. We used a strategy-based intervention focusing on episodic memory performance with a number-consonant mnemonic which is a mnemonic for memorizing digit-codes. A different set of predictors was observed for baseline episodic memory performance and training gain. Those that are better off in terms of episodic memory performance, also gain more in the episodic memory criterion task. Further, a higher rate of processing speed and better verbal knowledge also influenced gain beyond the other factors. The results have both theoretical implications regarding trainability of cognitive functions and practical implications regarding design of training programs.

Keywords

Cognitive training, aging, old adults, executive function, life-span, individual differences, episodic memory, inhibition, shifting, updating, cognitive control, strategy training, mnemonics, predictors

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