Center for Lifespan Psychology

Max-Planck-Institut für Bildungsforschung
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The COGITO Study: Practice Improves Cognitive Abilities in Adulthood

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Introduction

Longitudinal evidence suggests that active lifestyles enhance cognitive functioning in adulthood and old age. However, cognitive interventions generally have failed to improve cognitive abilities. Plastic changes in adult cognition may require interventions of higher dosage and larger scope than implemented so far.

Study Design

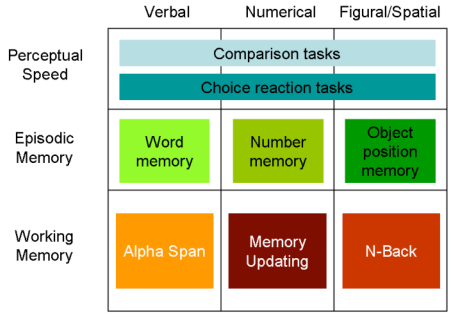
Hundred-one younger and 103 older adults practiced 12 cognitive tasks on 101 days. Data from no-contact control groups with 44 younger and 39 older adults were collected as well. On average, the time elapsing between pretest and posttest was 192 days.

Sample Characteristics

Group	n	Percent Women	Age	Digit Symbol	Years of Education
Younger Practice	101	51.5	25.6 (2.7)	60.3 (9.5)	16.1 (3.2)
Younger Control	44	47.7	25.2 (2.5)	59.6 (8.7)	15.7 (2.7)
Older Practice	103	49.5	71.3 (4.1)	43.6 (9.0)	13.6 (3.6)
Older Control	39	48.7	70.6 (4.0)	44.4 (8.5)	13.0 (3.9)

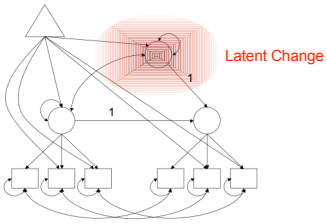
Dosage and Scope of Intervention

The 12 practice tasks were stratified by ability and content. Each task was practiced on each testing day. The difficulty levels of the working memory and episodic memory tasks were individually calibrated at pretest.



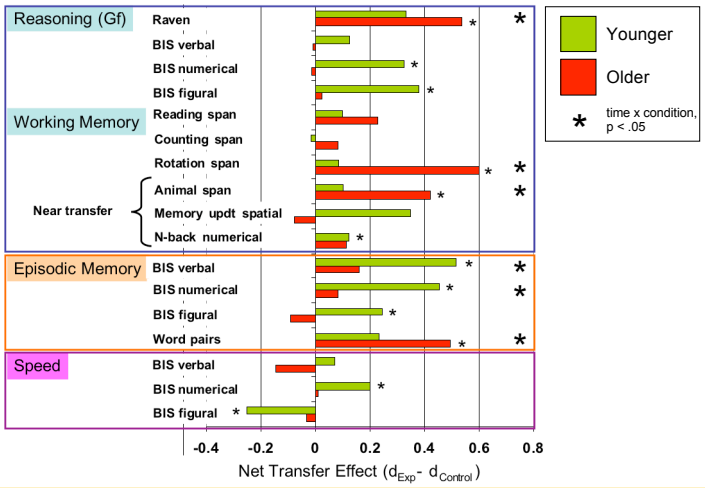
Methods

A large battery of transfer tests was administered at pre- and posttest. Transfer was considered reliable when change was significantly more positive in the intervention than in the control group. Consistent transfer at the task level was followed up at the ability level with latent difference score modeling (McArdle & Nesselroade, 1994).



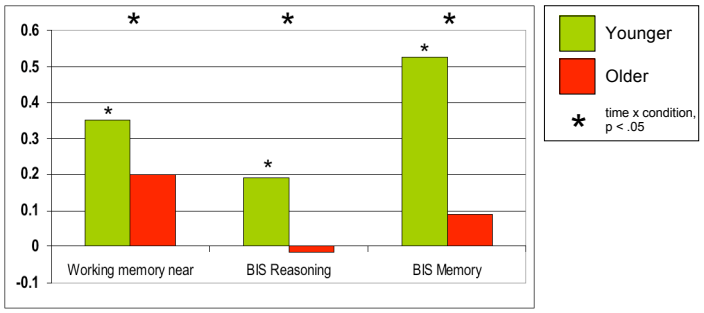
Results I: Transfer to Unpracticed Tasks

All participants in the intervention showed marked improvements in the practiced tasks (not displayed here). More importantly, we found nearest, near, and far transfer to unpracticed tasks, including the Raven.



Results II: Transfer to Cognitive Abilities

Participants improved in working memory, reasoning, and episodic memory. Analyses by age group reveal that overall gains were due to younger adults.



Conclusions and Outlook

Cognitive intervention can improve cognitive abilities in adulthood. Dosage and scope of practice matter.

Improvement is less general in older adults than in younger adults.

Individual differences in potential for plastic changes, especially among older adults, need to be examined.

Pretest-posttest analyses of MRI and EEG data with subsamples from this study are underway to delineate brain mechanisms of cognitive plasticity.

At least in adulthood, improvements in cognitive abilities may require sustained efforts to overcome a mismatch between available cognitive resources and environmental demands (cf. Lövdén et al., in prep.).

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