

# CAN EXECUTIVE FUNCTIONS BE TRAINED IN LATE ADULTHOOD AND MILD COGNITIVE IMPAIRMENT?

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**ERA AGE 2**

European  
Research  
Area in  
Ageing

## Background

**Executive functions** are crucial for learning new information and skills. Substantial age-related changes in executive abilities, with increase during childhood and subsequent decrease in older age, have been observed in previous studies. There is some evidence showing that both children, young adults and older adults can benefit from executive training and even show transfer to untrained tasks, which bears direct relevance to the development of cognitive rehabilitation.

**Mild cognitive impairment (MCI)** has become an important research topic, as patients with this condition have been shown to be at risk of developing Alzheimer's disease (AD) or other neurodegenerative diseases.

## Methods

### Experiment 1: Training of set shifting in late adulthood

Forty older adults will participate (20 training group/20 control group, training 3 times a week for 2 weeks). Three different training tasks will be used in the training group, and the control group will receive "placebo training". Near and far transfer of training effects will be measured by a number of tasks.

→ Depending on the results, 15 MCI patients will possibly be trained with the same paradigm

### Experiment 2: Working memory updating in MCI

Research by our Scandinavian research partners has indicated clear cut training gains in this domain in young and elderly adults (Dahlin et al., 2008). Therefore, we will employ the training paradigm of Dahlin et al. (2008) on MCI patients. Thirty MCI patients will be studied (15 training group/15 control group, training 3 times a week for 5 weeks) and the control group will receive "placebo training". Near and far transfer of training effects will be measured by a number of tasks.

#### References:

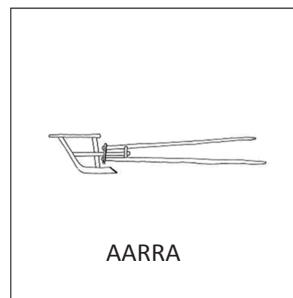
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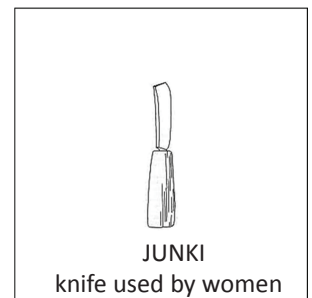
## Aims of the research project

The aim of this project is to study functional improvement in normal aging and MCI by training executive functions. Given the effects that executive dysfunction has on various situations and populations, it is of particular interest to find out whether these functions can be improved with practice.

The trainability of two closely related executive domains, flexible shifting between tasks (Experiment 1), and working memory updating (Experiment 2) will be studied. Furthermore, based on our previous research, another type of task that requires the use of metacognitive strategies, namely new word learning, will be further investigated in MCI patients (Experiment 3).



20 object names without definition



20 object names + definition (semantic support)

### Experiment 3: Strategies as a learning aid in MCI

Thirty MCI patients (2 experimental groups, i.e. 15 patients per group) will be trained using a similar paradigm as in a previous study (Grönholm-Nyman et al., 2010), i.e., the names of 40 unfamiliar objects will be trained with (20 objects) or without (20 objects) semantic support (=object definition). Additionally, one patient group will be aided in actively creating *semantic strategies* (by asking them what they think the object has been used for), the other patient group will be aided in actively creating *phonological strategies* (by asking them if they think that the object name resembles any familiar word), in order to learn the objects names.

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