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# Dynamics in cognitive ageing

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## Abstract

While some people age gracefully and are able to achieve levels of performance comparable to young adults, others show cognitive decline with increasing age. A pressing challenge is to understand the various ways in which aging affects cognitive performance and which mechanisms underlie the individual differences in age-related changes on cognition. In different projects, we examine these dynamics in cognitive functioning in young and older individuals. Even though all participants were healthy and functioned adequately in daily life, we found large differences between individuals on both performance and brain activity measured in working memory and attention tasks. Using functional connectivity analyses and event related potentials we showed that especially high performing elderly use more cognitive control to achieve similar performance to high performing younger participants. This shows that some of the older participants seemed to be able to effectively compensate for their age related decline. An additional question addressed in our studies followed from the knowledge that ageing is accompanied by general changes in brain structure and neuronal activity. These changes might directly affect neural connectivity. We used fMRI to examine whether changes in function brain networks are related to age related performance changes. Preliminary results suggest that aging indeed appears to be associated with changes in specificity of functional networks.

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