

# How the brain copes with multi tasking alters with age

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The pattern of blood flow in the prefrontal cortex in the brains alters with age during multi-tasking, finds a new study in BioMed Central's open access journal *BMC Neuroscience*. Increased blood volume, measured using oxygenated haemoglobin (Oxy-Hb) increased at the start of multitasking in all age groups. But to perform the same tasks, healthy older people had a higher and more sustained increase in Oxy-Hb than younger people.

Age related changes to the brain occur earliest in the prefrontal cortex, the area of the brain associated with memory, emotion, and higher decision making functions. It is changes to this area of the brain that are also associated with dementia, depression and other neuropsychiatric disorders. Some studies have shown that [regular physical activity](#) and cognitive training can prevent [cognitive decline](#) (use it or lose it!) but to establish what occurs in a healthy [aging brain](#) researchers from Japan and USA have compared brain activity during single and dual tasks for young (aged 21 to 25) and older (over 65) people.

Near [infrared spectroscopy](#) (NIRS) measurements of Oxy-Hb showed that blood flow to the prefrontal cortex was not affected by the physical task for either age group but was affected by the mental task. For both the young and the over 65s the start of the calculation task coincided with an increase in blood volume which reduced to baseline once the task was completed.

The main difference between the groups was only seen when performing

the physical and mental tasks at the same time - older people had a higher prefrontal cortex response which lasted longer than the younger group.

Hironori Ohsugi, from Seirei Christopher University, and one of the team who performed this research explained "From our observations during the dual task it seems that the older people turn their attention to the calculation at the expense of the physical task, while younger people are able to maintain concentration on both. Since our subjects were all healthy it seems that this requirement for increased activation of the [prefrontal cortex](#) is part of normal decrease in brain function associated with aging. Further study will show whether or not dual task training can be used to maintain a more youthful brain."

**More information:** Differences in dual-task performance and prefrontal cortex activation between younger and older adults Hironori Ohsugi, Shohei Ohgi, Kenta Shigemori and Eric B Schneider, *BMC Neuroscience* (in press)

Provided by BioMed Central

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