

New screening tool could help diagnose early cognitive decline in dementia from home

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Credit: AI-generated image ([disclaimer](#))

An international team of scientists have developed a new way to screen for age-related cognitive decline at home using a test which asks people to detect sounds and flashes on their laptop or phone.

Developed by researchers from Switzerland and the UK, the study shows

that the simple, cost-effective test may be used to help improve early diagnosis of Mild Cognitive Impairment (MCI) and provide interventions as early as possible. This is particularly relevant given that MCI can develop into Alzheimer's disease in 30 to 50 percent of people.

The research, which included UK researchers Dr. Trudi Edginton from City, University of London and Dr. Alison Eardley from the University of Westminster, also sheds new light on our understanding of how the brains of older individuals process information from the different senses. It is published today in today in *Nature Scientific Reports*.

There are currently no diagnostic blood tests like those for diabetes for MCI, and instead the existing diagnosis involves lengthy neuropsychological assessments with tests of cognitive control and memory, along with questions about daily activities and mood. These costly tests require training, often take a lot of patient and clinician time, and can be impacted by factors such as the individual's IQ, socio-economic status and even the testers themselves. As a result, with an ageing global population, and an around 50 million people estimated to be living with dementia worldwide, there is an urgent need for such a test.

As part of the study, the 123 participants were simply asked to press a button whenever they saw a flash of light or heard a sound. At times, the flashes or sounds were presented alone, but at other times the two appeared simultaneously. The participants included 51 healthy young adults, 49 healthy older adults and 23 older MCI adults.

The researchers, who were led by Professor Micah Murray from the University of Lausanne, Switzerland, then extracted two measures about each person's performance: 1) whether they were faster at detecting flashes or sound, and 2) the extent to which they benefited from detecting an auditory-visual event versus either flashes or sounds. Dr.

Paul Matusz from the University of Lausanne explained that by using just these two measures, the team could accurately tell if a person was diagnosed with MCI using standard clinical tests.

Professor Murray, Professor of Radiology and Clinical Neurosciences at the University Hospital Centre and University of Lausanne, said:

"We are particularly excited about this work because it shows how very simple tests can help [clinical practice](#) by reaching a wider population, at a lower cost. We are happy that our findings clarify the link between our vision and hearing and their role in supporting memory (dys-)function; it becomes increasingly clear that how preserved our cognitive skills are as we age depends on how intact our senses are. This importantly extends our similar existing findings in school-age children."

Dr. Alison Eardley, a psychologist at the University of Westminster (London, UK), explained the impetus for the study:

"The current tools used for assessing abnormal ageing are by no means unanimously supported or even sufficient on their own. Not a single existing assessment instrument currently provides an unequivocal diagnosis. The choice of the primary diagnostic tool itself continues to be a topic of a heated debate."

Dr. Trudi Edginton, a cognitive neuroscientist and clinical psychologist at City, University of London (London, UK), said:

"Our findings open the exciting possibility that a simple perceptual task could be a valuable complementary screening and assessment tool for MCI. However, the [test](#) we introduced should not yet be considered as a substitute or replacement for tests currently used in clinical practice.

The team is now designing new ways to validate this new screening tool

and exploring the role of neurotransmitter systems in age-related and pathological changes in sensory and cognitive functions to inform [early diagnosis](#) and potential treatment options."

More information: Micah M. Murray et al. Sensory dominance and multisensory integration as screening tools in aging, *Scientific Reports* (2018). [DOI: 10.1038/s41598-018-27288-2](https://doi.org/10.1038/s41598-018-27288-2)

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