

Higher aerobic fitness levels are associated with better word production skills in healthy older adults

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Healthy older people who exercise regularly are less inclined to struggle to find words to express themselves, research led by the University of

Birmingham has discovered.

Researchers found that [older adults' aerobic fitness](#) levels are directly related to the incidence of age-related language failures such as 'tip-of-the-tongue' states.

The research, published today in *Scientific Reports*, is the first of its kind to investigate the relationship between aerobic [fitness](#) levels and temporary cognitive lapses, such as not having a word come to mind when speaking - known as a 'tip-of-the-tongue' state.

People in a tip-of-the-tongue state have a strong conviction that they know a word, but are unable to produce it, and this phenomena occurs more frequently as we grow older.

The University of Birmingham study - carried out in collaboration with the University of Agder in Norway, the University of Leuven in Belgium and King's College London - measured the occurrence of tip-of-the-tongue states in a psycholinguistic experiment.

The study saw a group of 28 healthy [adults](#) (20 women with the average age of 70 and 8 men with the average age of 67), being compared in a 'tip-of-the-tongue' language test to 27 young people (19 women with the average age of 23 and 8 men with the average age of 22).

The test involved a 'definition filling task', done on a computer. They were asked to name famous people in the UK, such as authors, politicians and actors, based on 20 questions about them. They were also given the definitions of 20 'low frequency' and 20 'easy' words and asked whether they knew the word relating to the definition.

The participants' underwent a static bike cycling test - a gold standard test which quantified their ability to use oxygen during exercise and their

resulting individual aerobic fitness levels.

Lead author Dr Katrien Segaert, of the University of Birmingham's School of Psychology, said: "Older adults free from medical diseases still experience age-related cognitive decline.

"Significantly, what we found was that the degree of decline is related to one's aerobic fitness.

"In our study, the higher the older adults' aerobic fitness level, the lower the probability of experiencing a tip-of-the-tongue state.

"Importantly, our results also showed that the relationship between the frequency of tip-of-the-tongue occurrences and aerobic fitness levels exists over and above the influence of a person's age and vocabulary size."

Dr Segaert said that tip-of-the-tongue states are uniquely a problem with language functioning.

"Older adults sometimes worry that tip-of-the-tongue states indicate serious memory problems but this is a misconception: tip-of-the-tongue states are not associated with memory loss," she added. "In fact, older adults usually have a much larger vocabulary than young adults. Instead, tip-of-the-tongue [states](#) occur when the meaning of a word is available in our memory, but the sound form of the word can temporarily not be accessed."

"Accessing the sound forms of words is essential for successful and fluent language production, and its disruption has very noticeable negative consequences for older adults."

She said she hoped the study would add gravitas to the public health

message that [regular exercise](#) is important to ensure healthy ageing.

She added: "There are a lot of findings already on the benefits of aerobic fitness and regular exercise, and our research demonstrates another side of the benefits, namely a relationship between fitness and language skills. We were able to show, for the first time, that the benefits of aerobic fitness extend to the domain of language."

"Maintaining good language skills is extremely important for older adults. Older adults frequently have word finding difficulties and they experience these as particularly irritating and embarrassing."

"Speaking is a skill we all rely on every day. Communication with others helps us maintain social relationships and independence into old age."

In future research, the University of Birmingham plans to undertake exercise intervention studies to determine whether regular exercise can successfully increase [language](#) abilities.

More information: K. Segaert et al, Higher physical fitness levels are associated with less language decline in healthy ageing, *Scientific Reports* (2018). [DOI: 10.1038/s41598-018-24972-1](https://doi.org/10.1038/s41598-018-24972-1)

Provided by University of Birmingham

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