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Intensive training for aphasia: Even older patients can improve

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Older adults who have suffered from aphasia for a long time can nevertheless improve their language function and maintain these improvements in the long term, according to a study by Dr. Ana Inés Ansaldo, PhD, a researcher at the Research Centre of the Institut universitaire de gériatrie de Montréal (University Geriatrics Institute of Montreal) and a professor in the School of Speech-Language Pathology and Audiology at the Faculty of Medicine of Université de Montréal. The study was published in *Brain and Language*.

After six weeks of intensive and specific language therapy, seniors with aphasia demonstrated better performance at naming objects along with better cognitive potential. "The evidence collected in this functional neuroimaging study shows that language therapy stimulates the brain to use alternate circuits. These new circuits remain active after therapy and can help the person recover additional words. Performance was equivalent six months after the study, and family members told us that they could still see improvements at this point," explained Dr. Ansaldo.

This training not only stimulates the circuits that deal with language but also integrates another major brain system called the default mode network. This network is characterized by activity when the brain is "on standby" and not focused on performing a particular task. For the first time, this study describes the activity of this network in people with aphasia, and points out irregularities associated with this language impairment. Abnormal functioning in the default network has been associated with cognitive deficits, such as attention or episodic memory

disorders. The study showed that following speech-therapy, connectivity in the default mode in aphasic subjects reached a similar level to that of the healthy control subjects after therapy.

"The results of this study are encouraging regarding the aging brain's potential to recover. Thus, seniors who have had aphasia for many years are often no longer receiving treatment for their condition. We have shown that language therapy has a positive impact even long time after stroke, and not only on language but also on general cognition, as shown by the positive changes in the default network. My hope is that these findings will change clinical attitudes towards seniors who suffer from language disorders, by providing intensive, specific and focused stimulation for these patients. This therapy leads to very promising outcomes, even long after diagnosis," concluded Dr. Ansaldo.

Previous research on participants with aphasia has mainly been based on standard functional neuroimaging analysis. Recent studies have shown that functional connectivity analysis can detect compensatory activity, not revealed by standard analysis. Little is known, however, about the default-mode network in aphasia. In the current study, we studied changes in the default-mode network in subjects with aphasia who underwent semantic feature analysis therapy. We studied nine participants with chronic aphasia and compared them to ten control participants. For the first time, we identified the default-mode network using spatial independent component analysis, in participants with aphasia. Intensive therapy improved integration in the posterior areas of the default-mode network concurrent with language improvement. Correlations between integration and improvement did not reach significance, but the trend suggests that pre-therapy integration of the default-mode network may predict therapy outcomes. Functional connectivity allows a better understanding of the impact of semantic feature analysis in aphasia.

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