$12 Million for a Center for Research on Aphasia

NIH grant to support work on devastating disorder that robs brain of language

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EVANSTON, Ill. --- Northwestern University has received a $12 million grant from the National Institutes of Health (NIH) to establish a center devoted to research on aphasia, a devastating language disorder that essentially robs the brain of language. The grant is the largest ever awarded to a School of Communication researcher.

"In the U.S. alone, more than one million people suffer from aphasia, rendering normal communication impossible," said Cynthia Thompson, who will direct the new Center for the Neurobiology of Language Recovery. "For the first time, the best researchers in the field will work together to find biomarkers that can predict language recovery."

A world-renowned researcher on aphasia, brain plasticity and language recovery, Thompson is the primary investigator of the prestigious NIH Center grant and the Jean and Ralph Sundin Professor of Communication Sciences.

The center will bring Thompson and top aphasia researchers from Johns Hopkins, Harvard and Boston universities together to do large-scale investigations that shed light on how language is processed in healthy people and how language recovers when impaired by stroke or other neurological disease processes.

Research conducted through the new center will have the potential to challenge existing clinical practices for aphasia and promote the availability of treatment for individuals with chronic aphasia. Health insurance policies today typically restrict treatment to only a few sessions immediately after the onset of stroke.

The work of the center is expected to significantly impact clinical intervention practices for individuals with aphasia as well as expand knowledge about brain plasticity and the reorganization of language functions. The center, which will study more than 200 patients, also will generate a large database for other researchers to access.

At Northwestern, Thompson will continue her focus on agrammatic aphasia, a form of aphasia that affects the ability to understand and produce sentences. At Harvard and Boston, researchers David Caplan and Swathi Kiran will study anomic aphasia, a form of aphasia that affects processing of spoken words. And at Johns Hopkins, Brenda Rapp will conduct research on the neurobiology of the recovery of spelling (writing) processes.

In groundbreaking research, Thompson has shown that the brain has the capacity to recover many years following stroke as opposed to only in the first few months after stroke's onset. She also has demonstrated that behavioral treatment of aphasia focused on improving impaired language processing affects not only the ability to understand and produce language but also activity in the brain.

"Right now we know little about the factors that affect language recovery, although our recent work examining blood flow in the brain holds promise," Thompson said. In a landmark 2010 study, she and her team discovered that measures of blood flow can aid in predicting language recovery following stroke.

Researchers will study blood flow and other potential biomarkers of recovery, including brain activity during the "resting state." Using functional magnetic resonance imaging (fMRI), they also will study the integrity of white matter tracts (the fibers that connect brain regions with one another) and whether damage to these

tracts influences language recovery.

Across projects, the researchers will gather behavioral and neuroimaging data using a common, comprehensive battery of measures. They will include fMRI, structural and perfusion imaging and diffusion tensor imaging as tools for identifying, monitoring and evaluating areas of the brain associated with language recovery.

In more exploratory research, researchers will use eye tracking to study cognitive strategies used by healthy and brain damaged people while they process language. Researchers will track the eye movement patterns of healthy people, compare those patterns to those of people with aphasia, and study how, or if, eye movements normalize with recovery.