Brain's singular way with language

Good day. *Bonjour. Buenos dias.*

Whether you use one language or several to express such sentiments, it may not make much difference to your brain.

A single network of brain regions apparently allows people to speak both their native language and a second language, a new brain scan investigation finds. If confirmed in further studies, the results indicate that a core brain system underwrites the capacity to speak any number of languages.

"We find no evidence. . . that a language learned later in life is represented [in the brain] differently from the native language," a team of neuroscientists concludes in the March 27 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.

Denise Klein and her colleagues at McGill University in Montreal studied six men and six women who spoke English as their native language and had also learned to speak French fluently. Volunteers viewed a list of English words and for each entry came up with a word similar in meaning, a word that rhymed, and a translation into French. Then they cited synonyms and translations for French words.

A positron emission tomography (PET) scanner yielded color-coded brain images that highlighted areas where the rate of blood flow changed the most during each task (after the researchers had accounted for blood flow alterations while participants simply repeated words). Jumps or dips in cerebral blood flow reflect heightened or lowered brain cell activity.

On all tasks, regardless of whether English or French was used, the same parts of the brain's left side showed increased activity, Klein's team reports. These consisted of two adjacent frontal lobe sections and several sites positioned further back.

Blood flow surged in a separate brain area only during word repetition, the scientists note. Automatic responses of this type may travel along a different neural pathway than more complex verbal feats, such as retrieving a word's meaning.

Molecular clue to schizophrenia

Many cases of schizophrenia, a severe mental disorder that disrupts thought and emotion, may stem in part from an inadequate supply of a protein that enhances the flexibility of brain structures involved in learning and memory, according to a preliminary study.

The substance, a form of the neural cell adhesion molecule (NCAM), promotes brain growth and organization shortly before and after birth. Later, it congregates in a few structures that continue to undergo change in adulthood as a result of learning, such as the sea-horse-shaped hippocampus.

David Barbeau, a psychiatrist at McGill University in Montreal, and his coworkers obtained samples of hippocampal and frontal lobe tissue from the brains of 10 deceased people who had been treated for chronic schizophrenia, along with 11 deceased controls who had been free of neurological or psychiatric problems. The researchers exposed the tissue to an antibody that tags neurons possessing NCAM.

They found a moderate to severe reduction in the number of NCAM-bearing cells in part of the hippocampus in eight of the schizophrenic brains, compared with one control. This finding could reflect an NCAM shortage that originates in the womb and eventually derails brain connections between the hippocampus and other areas critical for organizing thought and memory, the researchers argue in the March 27 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.