

## Language juggling rewires bilingual brain in a good way

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*Summary:* Bilinguals use and learn language in ways that change their minds and brains, which has consequences -- many positive, according to a cognitive scientist.

### FULL STORY

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Bilinguals use and learn language in ways that change their minds and brains, which has consequences -- many positive, according to Judith F. Kroll, a Penn State cognitive scientist.

"Recent studies reveal the remarkable ways in which bilingualism changes the brain networks that enable skilled cognition, support fluent language performance and facilitate new learning," said Kroll, Distinguished Professor, psychology, linguistics and women's studies.

Researchers have shown that the brain structures and networks of bilinguals are different from those of monolinguals. Among other things, the changes help bilinguals to speak in the intended language -- not to mistakenly speak in the "wrong" language.

And just as humans are not all the same, bilinguals are not all the same and the changes in the mind and brain differ depending on how the individual learned the language, what the two languages are and the context the languages are used in.

"What we know from recent research is that at every level of language processing -- from words to grammar to speech -- we see the presence of cross-language interaction and competition," said Kroll, Distinguished Professor of psychology, linguistics and women's studies. "Sometimes we see these cross-language interactions in behavior, but sometimes we only see them in brain data."

Kroll presented recent findings about how bilinguals learn and use language in ways that change their minds and brains today (Feb. 13) at the annual meeting of the American Association for the Advancement of Science.

Both languages are active at all times in bilinguals, meaning the individuals cannot easily turn off either language and the languages are in competition with one another. In turn this causes bilinguals to juggle the two languages, reshaping the network in the brain that supports each.

"The consequences of bilingualism are not limited to language but reflect a reorganization of brain networks that hold implications for the ways in which bilinguals negotiate cognitive competition more generally," said Kroll.

Kroll was instrumental in establishing the first U.S. chapter of Bilingualism Matters at Penn State, within the University's Center for Language Science. Bilingualism Matters is an international organization that aims to bring practically applicable findings from current bilingual research to the public.

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