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Juggling languages can build better brains

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Washington D.C. -- Once likened to a confusing tower of Babel, speaking more than one language can actually bolster brain function by serving as a mental gymnasium, according to researchers.

Recent research indicates that bilingual speakers can outperform monolinguals--people who speak only one language--in certain mental abilities, such as editing out irrelevant information and focusing on important information, said Judith Kroll, Distinguished Professor of Psychology, Penn State. These skills make bilinguals better at prioritizing tasks and working on multiple projects at one time.

"We would probably refer to most of these cognitive advantages as multi-tasking," said Kroll, director of the Center for Language Science. "Bilinguals seem to be better at this type of perspective taking."

Kroll said that these findings counter previous conclusions that bilingualism hindered cognitive development.

"The received wisdom was that bilingualism created confusion, especially in children," said Kroll told attendees today (Feb. 18) at the annual meeting of the American Association for the Advancement of Science in Washington D.C. "The belief was that people who could speak two or more languages had difficulty using either. The bottom line is that bilingualism is good for you."

Researchers trace the source of these enhanced multi-tasking skills to the way bilinguals mentally negotiate between the languages, a skill that Kroll refers to as mental juggling.

When bilinguals speak with each other, they can easily slip in and out of both languages, often selecting the word or phrase from the language that most clearly expresses their thoughts. However, fluent bilinguals rarely make the mistake of slipping into another language when they speak with someone who understands only one language.

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"The important thing that we have found is that both languages are open for bilinguals; in other words, there are alternatives available in both languages," Kroll said. "Even though language choices may be on the tip of their tongue, bilinguals rarely make a wrong choice."

This language selection, or code switching, is a form of mental exercise, according to Kroll.

"The bilingual is somehow able to negotiate between the competition of the languages," Kroll said. "The speculation is that these cognitive skills come from this juggling of languages."

Kroll's symposium at the meeting included distinguished language scientists who have investigated the consequences of bilingualism across the lifespan. Ellen Bialystok, Distinguished Research Professor of Psychology at York University, Toronto, was instrumental in demonstrating that bilingualism improves certain mental skills.

According to Bialystok, the benefits of bilingualism appear across age groups. Studies of children who grow up as bilingual speakers indicate they are often better at perspective-taking tasks, such as prioritizing, than monolingual children. Experiments with older bilingual speakers indicate that the enhanced mental skills may protect them from problems associated with aging, such as Alzheimer's disease and dementia.

Researchers use MRIs and electroencephalographs to track how the brain operates when it engages in language juggling. They also use eye-movement devices to watch how bilinguals read sentences. When a person reads, the eyes jump through the sentence, stopping to comprehend certain words or phrases. These distinctive eye movements can offer researchers clues on the subtle ways bilinguals comprehend language compared to monolinguals.

Kroll noted that the enhanced brain functions of bilinguals do not necessarily make them more intelligent or better learners.

"Bilinguals simply acquire specific types of expertise that help them attend to

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critical tasks and ignore irrelevant information," Kroll said.

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