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Penn State

\$2.8 million NSF grant supports bilingual thinking, learning study

Exactly what goes on in the minds and brains of bilingual speakers when individuals first learn and then actively use two languages is the focus of a five-year, \$2.8 million National Science Foundation grant to Penn State's Center for Language Science, based in the Colleges of Liberal Arts and Health and Human Development.

The project, "Bilingualism, mind, and brain: An interdisciplinary program in cognitive psychology, linguistics and cognitive neuroscience," involves researchers from 10 universities and is supported by the NSF's Partnership for International Research and Education (PIRE.)

The researchers will aim to greatly expand the existing body of knowledge on the neural and cognitive processes involved in second language learning and bilingualism. The project's cross-disciplinary and international design ensures that the central research questions will be answered through the integration of techniques from linguistics, psychology and neuroscience, according to principal investigator Judith Kroll, Distinguished Professor of psychology, linguistics and women's studies.

"A majority of people in the world are multi-lingual and when they listen to others speak, read text, or speak themselves, their brains activate all of the languages that they know," said Kroll. "Yet they have no difficulty speaking one language without mixing in words from the other language, and they can also intentionally switch between the two languages within a single sentence. Our team plans to ask how bilingual speakers achieve the cognitive ability to enable them to have simultaneous access to both languages but, at the same time, to speak the intended language.

The new project will allow the comparison of bilingual speakers of languages that share a writing system (English and Dutch, for example) or have different writing systems (English and Chinese), and speakers of different-modality languages (sign language and spoken language.)

"Research on bilingualism is a tool for revealing fundamental principles about the mind and the brain that otherwise go unseen in research on individuals who speak only one language," Kroll said. "It is notable that learning a second language after early childhood is typically a difficult task. The planned research on bilingualism will provide new knowledge about how the learning process enables or restricts proficient language use."

The grant will increase opportunities for undergraduate and graduate students to acquire international research experience through research internships. Undergraduates who join the project will first work closely with faculty and graduate students at Penn State, in an apprenticeship model, to gain valuable mentoring and scientific research training. The students will then have an opportunity to work with a PIRE university overseas in a research laboratory, collaborating with faculty and graduate student mentors at Penn State and abroad.

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In addition to Kroll, co-principal investigators are Paola Dussias, associate professor of Spanish and linguistics and associate director of the Center for Language Science; Ping Li, professor of psychology, linguistics, and information sciences and technology; and Janet van Hell, currently on the faculty at Radboud University in the Netherlands but scheduled to join the Penn State faculty in 2011 as professor of psychology and linguistics and director of the program in linguistics. Affiliated faculty at Penn State are Chip Gerfen, associate professor of Spanish and linguistics, head of the Department of Spanish, Italian,

and Portuguese, and acting director of the Program in Linguistics; Carrie Jackson, assistant professor of German and linguistics; John Lipski, the Edwin Sparks Professor of Spanish and linguistics; Richard Page, associate professor of German and linguistics; and Daniel Weiss, associate professor of psychology and linguistics.

The U.S. institutions in the PIRE partnership are the NSF-supported Science of Learning Center at Gallaudet University, the leading university for the deaf, and Haskins Laboratories, a premiere research institute for language, literacy, and neuroscience study, affiliated with Yale University. The global partners are University of Granada and University of Pompeu Fabra, both in Spain; University of Hong Kong and Beijing Normal University, both in China; the Max Planck Institute for Human Cognitive and Brain Sciences, Germany; University of Bangor, Wales, United Kingdom; and Radboud University Nijmegen, the Netherlands.

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