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Mental math dependant on language

COLLEGE STATION, - The language most bilingual people use to mentally solve math problems isn't necessarily their native language or even the language that is most prevalent in their environment. Psychological research shows it's the language in which they were first taught math - a finding with educational implications, especially for areas with high concentrations of bilingual persons.

Texas A&M University psychologist Jyotsna Vaid's research has found that bilinguals' preferred language for different mental arithmetic activities is the language in which the associated skills have been acquired.

Her research is part of a larger ongoing project aimed at exploring the role of language in bilingual people's mental computations. She says although bilingual people are capable of performing mental computations in either language, their preference is strongly influenced by the language in which they first learn math skills.

In areas, such as Texas, where the vast majority of Hispanic children receive mathematics instruction in English, this could place even more of an emphasis on English proficiency because this will be the language they continue to use to solve math problems, says Vaid, who has studied the cognitive aspects of bilingualism for nearly 20 years.

"A defining characteristic of at least first-generation Hispanic immigrants is use of Spanish," she says. "It is somewhat surprising, therefore, that none of the major studies that show decrements in school achievement and attainment in Hispanic populations have included measures of the student's primary language proficiency or proficiency in English."

School districts looking to address the lag in math and science test scores for Hispanic children should consider placing a strong emphasis on "true" bilingual instruction, Vaid notes.

Research, she says, suggests that children receiving such instruction stand to perform as well as or at higher levels of overall academic achievement than those receiving instruction in a second language or than monolingual comparison groups.

True bilingual instruction - in contrast to what she says is commonplace in schools now - is instruction that cultivates the child's native language in addition to teaching English. It is bilingual education that places worth on the child's first language instead of trying to transition them out of it and into English, she explains.

The problem is partly cognitive, she says, but partly social as well. There must be a positive social climate that values a bilingual individual, not one that aims to instill an English monolingualism, she adds.

Vaid's study, published in a special issue of "Spanish Applied Linguistics," examined four predictor variables for more than 500 Spanish-English college students who were asked about their preferred language for various mental activities.

On the question, "When doing simple mental arithmetic in your head, what language do you normally use?" nearly 95 percent reported a single language preference, with the language of choice being English for 84 percent and Spanish for 16 percent.

The variables studied were language of elementary school instruction, length of residence in the United States, age of second language acquisition, and degree of proficiency in the second language. All four variables significantly predicted language preference for mental arithmetic, with the language used in elementary school being the strongest predictor, Vaid says.

In addition, all of these factors, except for the age of the second language, also predicted language preference for thinking to oneself and dreaming, she adds.

For thinking to oneself, she says, the most important factor appears to be the amount of exposure to English (as defined by the length of stay in the United States), whereas for dreaming, language proficiency rates as the most influential.

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