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Being Bilingual Protects Against Some Age-Related Cognitive Changes, Says New Research

ScienceDaily (June 14, 2004) — WASHINGTON — Most will agree that two heads are better than one in solving problems. The same logic may be true for language and retaining cognitive processes as we age. Being fluent in two languages seems to prevent some of the cognitive decline seen in same-age monolingual speaking persons, according to the findings of a study appearing in this month's journal of Psychology and Aging.

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It is established that learned knowledge and habitual procedures (crystallized intelligence) hold up well as people age, said lead author Ellen Bialystok, Ph.D., of York University, but abilities that depend on keeping one's attention on a task (fluid intelligence) actually decline as people get older. But in her study, Bialystok found that those who have been bilingual most of their life were better able to manage their attention to complex set of rapidly changing task demands as measured by an experimental task — The Simon Task — that purposely distracts the test takers.

Three studies compared the performance of a total of 104 monolingual and bilingual middle-aged (30-59 year olds) and 50 older adults (60-88 year olds) on the Simon Task. The Simon task measures reaction time without the subjects having to be familiar with the content, and it measures aspects of cognitive processing that decline with age, according to the study. The subjects watched flashing squares on a computer screen and were instructed to press a particular color key when they saw a square in a certain location of the screen. Half of the squares were presented on the same side of the screen where the correct key was located [congruent trials] and the other half of the squares were on the opposite side of screen where the correct key was located [incongruent trials].

Furthermore, to determine if speed was a factor in responding correctly in these tasks, a set of conditions that increased the number of different stimuli from two to four flashing squares was used. The bilinguals responded faster, said the authors, even when these stimuli were presented in the center of the screen and involved no interference from incongruent spatial position information. A control condition was used that presented two stimuli (flashing squares) in the center of the screen that produced no difference in reaction time, said the authors, thus ruling out an overall speed advantage as the explanation for performance differences between the bilingual and monolingual groups.

In all three studies, monolingual and bilingual adults who were matched on background experiences and cognitive measures performed differently on the Simon task. Both younger and older bilinguals were faster than subjects who spoke one language in both the congruent and incongruent trials but also exhibited less distraction from the incongruent items regardless of speed. Importantly, say the authors, bilingualism reduced the age-related increase in the Simon effect (distractibility), implying that life-long experience of managing two languages attenuates the age-related decline in the efficiency of inhibitory processing.

The authors propose that the ability to attend to a stimulus while ignoring irrelevant location information might be the same cognitive control processes used when using two languages.

All the bilinguals in this study used their two languages everyday since they were 10 years of age. The authors conclude that bilingualism offers widespread benefits across a range of complex cognitive tasks.

The research was carried out both at York University and at Baycrest's Rotman Research Institute, where Dr. Bialystok is a visiting scientist.

Article: "Bilingualism, Aging, and Cognitive Control: Evidence From the Simon Task," Ellen Bialystok, Ph.D., and Mythili Viswanathan, M.A., York University; Fergus I. M. Craik, Ph.D., Rotman Research Institute; Raymond Klein, Ph.D., Dalhousie University; Psychology and Aging, Vol. 19, No. 2.

Full text of the article is available from the APA Public Affairs Office or at http://www.apa.org/journals/pag/press_releases/june_2004/http192290.html

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