

# SUPPORTING A LIFETIME OF GOOD COGNITIVE HEALTH

**Use it or lose it. It's a common mantra these days and a driving force behind a trend among seniors to remain physically and intellectually active. But new research suggests that maintaining good cognitive health in old age is not just a matter of picking up a crossword puzzle habit on retirement day. It's a lifelong process, according to research coming out of the laboratory of Sherif Karama, MD, PhD, of the McConnell Brain Imaging Center at McGill University.**

**D**r. Karama and colleagues analyzed data on 588 individuals who formed part of the 1936 Lothian Birth Cohort. Their IQs were measured when they were 11 years old and again when they were 70. When they were around 73, these subjects also underwent magnetic resonance imaging (MRI) to determine the thickness of their cortex at more than 80,000 sampling points.

## LINK BEGINS IN CHILDHOOD

Previous studies have linked greater cortical thickness in old age with preserved cognitive function. This association was confirmed in Dr. Karama's research, but his findings added a new dimension. It turns out that IQ at age 11 accounted for more than two-thirds of the association between IQ at age 70 and cortical thickness at age 73.

"We have seen an association between the thickness of the cortex and preservation of cognitive ability," says Dr. Karama, "but this does not start in old age. It's something that appears to be present all your life." In other words, brain health starts young. How young remains unclear. It may even begin *in utero*.

## MANY QUESTIONS REMAIN

Is the association largely genetic or environmental? That is difficult to tease apart because the two interact. Studies "suggest that roughly 60% of differences in cognitive ability in childhood are accounted for by environmental factors and 40% by genetic factors,"



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says Dr. Karama. "As children age, the heritability of cognitive ability differences appears to increase. That appears to be in part due to the fact that more gifted individuals will tend to seek more stimulating environments. This could, in turn, positively affect cognitive abilities. Such an 'amplification' effect for the more gifted could potentially bias estimates of heritability."

What does this all mean? When studies show a correlation between the brain and cognitive function in older age, it can be tempting to assume that one causes the other, but that still remains to be confirmed. The evidence from Dr. Karama's research suggesting that the link is established much earlier than thought could have implications for identifying and remedying poor cognitive function in childhood, says Jean Séguin, PhD, an expert in

childhood psychosocial development at the University of Montreal. His group's research, as well as that of others, suggests that children who are socioeconomically disadvantaged benefit the most from stimulating environments such as quality daycares. But this research has also shown that those children who need such stimulating environments the most are also among the least likely to receive it. "This does not seem to be a matter of income," he says. Instead it could be because "mothers with less education have different childrearing beliefs and values or a harder time getting the health care services they need. Educated mothers know how to work the system." Public policy must address this discrepancy as it may have implications across the life span. 🦋

**BY ALISON PALKHIVALA**

Ref.: Karama S, Bastin ME, Murray C, Royle NA, Penke L, Munoz Maniega S, Gow AJ, Corley J, Hernandez MV, Lewis JD, Rousseau ME, Lepage C, Fonov V, Collins DL, Booth T, Rioux P, Sherif T, Adalat R, Starr JM, Evans AC, Wardlaw JM, Deary IJ. Childhood cognitive ability accounts for associations between cognitive ability and brain cortical thickness in old age. *Molecular Psychiatry* 2014;19(5):555-559. doi:10.1038/mp.2013.64.