

# Bigger brain size matters for intellectual ability

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Brain size matters for intellectual ability and bigger is better, McMaster University researchers have found.

The study, led by neuroscientist Sandra Witelson, a professor in the Michael G. DeGroote School of Medicine, and published in the December issue of the journal *Brain*, has provided some of the clearest evidence on the underlying basis of differences in intelligence.

The study involved testing of intelligence in 100 neurologically normal, terminally ill volunteers, who agreed that their brains be measured after death.

It found bigger is better, but there are differences between women and men.

In women, verbal intelligence was clearly correlated with brain size, accounting for 36 percent of the verbal IQ score. In men, this was true for right-handers only, indicating that brain asymmetry is a factor in men.

Spatial intelligence was also correlated with brain size in women, but less strongly. In men, spatial ability was not related to overall brain size. These results suggest that women may use verbal strategies in spatial thinking, but that in men, verbal and spatial thinking are more distinct.

It may be that the size or structure of the localized brain regions which underlie spatial skills in men is related to spatial intelligence, as was shown in previous research in Witelson's lab on the brain of Albert Einstein.

In a further sex difference, brain size decreased with age in men over the age span of 25 to 80 years, but age hardly affected brain size in women. It is not known what protective factors, which could be genetic, hormonal or environmental, operate in women.

It remains to be determined what the contribution of nature and nurture are to this cerebral size relationship with intelligence, Witelson said. She added that the results point to the need for responsibility in considering the likely future use of magnetic imaging (or MRIs) of brain structure as a measure of ability in student and workforce settings.

"We're going to need to be careful if, in the future, we use MRI brain scans as a measure of ability in any selection process," she said.

Source: McMaster University

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