

# Brain size mediates the association between height and cognitive ability

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Several studies have found that height and general cognitive ability, or intelligence, are positively associated. A recent study reveals a biological factor underlying this relationship: the size of the cerebral cortex.

Reports from several studies have identified a link between height and

general cognitive ability, or intelligence, but the mechanisms underlying this association are not well known. Researchers from the University of Helsinki, University of California San Diego and Boston University found that this association is mediated by cortical surface area.

The researchers examined the association between height and cognition through a model where the [size](#) of cortical grey matter was considered as a mediator. They found that greater height was associated with bigger cortex, which in turn was linked with better cognitive ability.

"Even though taller individuals have, on average, bigger [brain](#) compared to shorter people, the size of any given individual's brain cannot be determined by their stature alone. Further, cognitive ability is not simply determined by brain size," says the corresponding author of the research article Eero Vuoksima from the University of Helsinki.

"The findings do, however, shed light on the biological mechanism underlying the association between height and cognition."

In the study, cortical grey matter was measured with magnetic resonance imaging (MRI). The focus was on the total cortical surface area and mean cortical thickness. According to the findings, total surface area was bigger in taller persons, whereas height was not related to cortical thickness.

"These observations are in line with recent MRI studies of [cortical development](#) suggesting that cortical [surface](#) area increases until approximately the age of 12, whereas thinning of cortex occurs across the childhood and adolescence," notes Vuoksima.

The study participants were 51–60 year old American men. The researchers note that even though genetic effects accounted for most of the individual differences in height, cortical size and cognition, the

contribution of environmental factors may be much larger in other populations.

"For example, childhood malnutrition has an impact on both [height](#) and brain growth, and affects also cognitive development," reminds Vuoksimaa.

In the study, cognitive ability was measured with a paper-and-pencil test consisting of items measuring verbal, mathematical, spatial and reasoning abilities.

The study was published in the *Brain Structure & Function* journal.

**More information:** Eero Vuoksimaa et al. Brain structure mediates the association between height and cognitive ability, *Brain Structure and Function* (2018). [DOI: 10.1007/s00429-018-1675-4](https://doi.org/10.1007/s00429-018-1675-4)

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