

Children raised in greener areas have higher IQ, study finds

Research also found lower levels of difficult behaviour in rich and poor neighbourhoods

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There is growing evidence that green surroundings may improve cognitive function. Photograph: Veryan Dale/Alamy

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Children growing up in greener urban areas have increased intelligence and lower levels of difficult behaviour, a study has found.

The analysis of more than 600 children aged 10-15 showed a 3% increase in the greenness of their neighbourhood raised their IQ score by an average of 2.6 points. The effect was seen in both richer and poorer areas.

There is already significant evidence that green spaces improve various aspects of children's cognitive development but this is the first research to examine IQ. The cause is uncertain but may be linked to lower stress levels, more play and social contact or a quieter environment.

The increase in IQ points was particularly significant for those children at the lower end of the spectrum, where small increases could make a big difference, the researchers said.

“There is more and more evidence that green surroundings are associated with our cognitive function, such as memory skills and attention,” said Tim Nawrot, a professor of environmental epidemiology at Hasselt University in Belgium, where the study was conducted.

“What this study adds with IQ is a harder, well-established clinical measure. I think city builders or urban planners should prioritise investment in green

spaces because it is really of value to create an optimal environment for children to develop their full potential.”

The study, [published in the journal Plos Medicine](#), used satellite images to measure the level of greenness in neighbourhoods, including parks, gardens, street trees and all other vegetation.

The average IQ score was 105 but the scientists found 4% of the children with a score below 80 had grown up in areas with low levels of greenery, while none scored below that level in areas with higher amounts of green space.

The benefits of more greenery that were recorded in urban areas were not replicated in suburban or rural areas. Nawrot suggested this may be because those places had enough greenness for all children living there to benefit.

Behavioural difficulties such as poor attention and aggressiveness were also measured in the children using a standard rating scale, and the average score was 46. In this case, a 3% rise in greenery resulted in a two-point reduction in behavioural problems, in line with [previous studies](#).

The researchers took into account the wealth and education levels of the children’s parents, largely ruling out the idea that families who are better placed to support children simply have more access to green space.

Higher levels of [air pollution are known to impair intelligence](#) and childhood development but this factor was also ruled out as an explanation.

Instead, the scientists suggested lower noise levels, lower stress – as found in other research on green space benefits – and greater opportunities for physical and social activities may explain the higher IQ scores.



Two-hour 'dose' of nature significantly boosts health – study

Dr Mathew White, an environmental psychologist at Exeter University in the UK, who was not part of the study team, praised the quality of the research.

“I’m always wary of the term intelligence as it has a problematic history and unfortunate associations,” he said. “But, if anything, this study might help us move away from seeing intelligence as innate – it could be influenced by environment, and I think that is much more healthy.”

White said it was reasonable to suggest more exercise and less stress as reasons for the higher IQ scores. “But I’m not sure why general intelligence should be improved by these things,” he said. “My guess is the intelligence measures are really picking up a child’s ability to concentrate and stick at a task, which has been shown in green space studies before.”

A study of **children living in Barcelona**, published in 2015, showed more green space was associated with better working memory and attention.

The researchers in the new study were able to account for many of the factors likely to affect IQ but data on the type of green space was not available. Previous

work has shown this can be important, with trees giving more benefit to child development than farmland or scrubland, for example.

The team also did not have information on where the pupils attended school but most Belgian children go to nearby schools.