

# Positive thinking during pregnancy could help children's ability in math and science

February 8 2019

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Using data from Bristol's Children of the 90s study the research is one of a series from the University of Bristol, that examines a parental personality attribute known as the 'locus of control'. This is a

psychological measure of how much someone believes that they have control over the outcome of events in their life or whether external forces beyond their control dictates how life turns out.

Those with an external locus of control would believe there is little point in making an effort as what happens to them is due to luck and circumstances, in contrast with internally controlled people who are motivated into action because they feel they can influence what is going to happen.

Researchers examined the 'locus of control' by using responses from questionnaires completed by over 1600 [pregnant women](#) who took part in the Children of the 90s study. They then looked at the mathematical and scientific reasoning and problem-solving skills of their offspring at the ages of 8, 11 and 13 assessed in school using specially designed tests. This study is among the first to link the prenatal locus of control of parents to the maths and science abilities of their offspring years later.

Findings reveal that mothers with an internal locus of control before their child was born (those who believe in the connection between their actions and what happens to them) were more likely to have a child who is good at maths and science. Compared to their externally controlled peers, internally focussed mothers also were more likely to provide their [children](#) with diets that assist brain development, to more frequently read stories to them and to show an interest in their child's homework and academic progress.

Lead author and founder of the Children of the 90s study Professor Jean Golding OBE said:

"It is widely known that the locus of control of a child is strongly associated with their [academic achievements](#) but until now we didn't know if mothers' locus of control orientation during pregnancy had a

role to play in early childhood. Thanks to the longitudinal data from Children of the 90s study we can now make these associations.

"If our findings, that mothers' attitudes and behaviours can have an effect on their child's academic abilities, can be replicated it would suggest that more efforts should be made to increase the opportunities for mothers to feel that their behaviours will have a positive outcome for themselves and their children. It would help future generations raise healthy, confident and independent children.

"The next steps for this area of psychology will be for researchers to look at this at an international level to see if the findings are replicated. Other factors that will be important will be to undertake an intervention study to assess whether encouraging women to become more internal will improve the academic development of their children."

Candler Professor of Psychology Stephen Nowicki at Emory University, Atlanta, a co-author, and expert on locus of control added:

"Internal parents believe that they have behavioural choices in life. This and other findings from our child development work with the University of Bristol with expectant parents show that when they expect life outcomes to be linked to what they do their children eat better, sleep better and are better able to control their emotions. Such children later in childhood are also more likely to have greater academic achievements, fewer school related personal and social difficulties and less likelihood of being obese.

"It is possible for a parent to change their outlook; we've demonstrated in the past that parents who become more internal (i.e. learn to see the connections between what they do and what happens to their children) improved their parenting skills which would have a positive effect on their children's personal, social and academic lives."

**More information:** Prenatal external locus of control and reduced mathematical and science abilities in the offspring: a longitudinal birth cohort study , Jean Golding, Steven Gregory, Genette Ellis, Terezinha Nunes, Peter Bryant, Yaz Iles-Caven and Stephen Nowicki, *Frontiers in Psychology*, [DOI: 10.3389/fpsyg.2019.00194](https://doi.org/10.3389/fpsyg.2019.00194)

Provided by University of Bristol

Citation: Positive thinking during pregnancy could help children's ability in math and science (2019, February 8) retrieved 19 April 2024 from <https://medicalxpress.com/news/2019-02-positive-pregnancy-children-ability-math.html>

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