

Children of older fathers perform less well in intelligence tests during infancy

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Children of older fathers perform less well in a range of cognitive tests during infancy and early childhood, according to a study published this week in the open-access journal *PLoS Medicine*. In contrast, the study finds that children with older mothers gain higher scores in the same tests - designed to measure the ability to think and reason, including concentration, learning, memory, speaking and reading skills.

The age at which men and women are having [children](#) is increasing in the developed world, but whilst the "[biological clock](#)" - the effect of increasing maternal age on reduced fertility - is widely-discussed, the consequences of increased [paternal age](#) are not as well known. Recent evidence demonstrates a link between [older fathers](#) and specific health problems in their children, including birth deformities and cancer, as well as [neuropsychiatric conditions](#) such as autism and schizophrenia.

This new study by John McGrath, of the Queensland Brain Institute, [University of Queensland](#) in Australia, and colleagues, investigates the link between a father's age and their child's general cognitive ability, by reanalyzing an existing dataset of 33,437 children born between 1959 and 1965 in the United States. This data formed part of the US Collaborative Perinatal Project (CPP), which tested each child in the dataset at 8 months, 4 years and 7 years of age with a number of widely-used intelligence scales - including assessments of sensory discrimination and hand-eye coordination, conceptual and physical coordination, and at 7 years reading, spelling and arithmetic ability.

Crucially in their reanalysis of this dataset, McGrath and colleagues adjusted their study to take into account socio-economic factors. They used two models: one that focused on physical factors including the parents' age, and a second that indexed social factors such as maternal and paternal education and family income. They found that the older the father, the more likely the child was to have lower scores on the various tests used by the CPP - with the exception of one measure of physical coordination. The researchers also grouped the children by their mother's age and found that in contrast, the older the mother the higher the scores of the child in the cognitive tests.

Previous researchers have suggested that the children of older mothers may perform better because they experience a more nurturing home environment; if this is the case, this study suggests that children of older fathers do not necessarily experience the same benefit. The researchers advance several hypotheses as possibilities to explain the association between advanced paternal age and children's cognitive ability, including genetic and social arguments. Unlike a woman's eggs - which are formed when she herself is in the womb - a man's sperm accumulates over his lifetime, which previous studies have suggested can mean increased incidence of mutations in the sperm at an older age. However, as emphasized in an expert commentary on the findings by Mary Cannon (Royal College of Surgeons in Ireland) - who was uninvolved with the study - genetic and social factors can operate in conjunction. "New explanatory models are needed that can encompass socio-cultural and interpersonal factors as well as biological variables", she argues. Given the trend towards older maternal and paternal ages in the developing world, policy-makers may want to consider promoting an awareness of the risks to children that this study associates with delayed fatherhood.

More information: Saha S, Barnett AG, Foldi C, Burne TH, Eyles DW, et al. (2009) Advanced paternal age is associated with impaired neurocognitive outcomes during infancy and childhood. PLoS Med 6(3):

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