

Vision test gives insight into the effect of prenatal exposure to recreational drugs

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Children exposed to marijuana in the womb show a significant improvement in their ability to track moving objects at age four, according to new vision research. But researchers are warning that the results do not mean marijuana has a beneficial effect on foetal development.

The study from the University of Waterloo, University of Auckland and Brown University appears today in the journal *Scientific Reports*.

"We were surprised with this initial finding," said Ben Thompson, a professor in Waterloo's School of Optometry and Vision Science in the Faculty of Science. "It shows that [marijuana](#) and alcohol can have quite an impact on a fundamental aspect of the visual processing happening in our brains. But despite the apparently beneficial impact of marijuana on the development of the brain's visual system, other research shows its use can actually impair the brain development of unborn children."

The researchers tested higher-level visual processing in a group of 4 year-old children who were exposed to different combinations of marijuana, alcohol, methyl amphetamines, or nicotine while in the womb, compared with a non-exposed control group. Drug exposure was confirmed objectively by analyzing each baby's meconium.

Results showed exposure to marijuana improved global [motion perception](#), a measure of processing within the brain's dorsal visual pathway which is responsible for motion processing and visual-motor control. In contrast, exposure to alcohol had a negative effect. Nicotine and methamphetamine had no effect on vision compared with the control group.

This is the first time researchers have shown opposing effects of [drug exposure](#) on children's visual development. Their conclusions suggest that health professionals could counteract the negative

effects of drug use in pregnancy. But they caution this is a preliminary result of a much more comprehensive study.

"We don't know how widespread this effect is on other parts of the brain's [visual processing](#) areas," said Thompson. "The dorsal area is the first area we test because it's the most vulnerable to risk factors during early development."

Thompson and his colleagues at the University of Auckland modified a global motion perception test for use with young children as a quantitative means to measure dorsal pathway performance.

The test measures the child's ability to track a group of moving dots together across a screen despite the presence of randomly moving dots. The percentage of randomly moving dots is increased until the child can no longer tell which way the dots are moving.

Thompson is currently developing a semi-automated objective motion processing test that can be used across different age groups that may help to track early brain development problems.

"The advantage with this type of vision testing is that performance can be measured precisely," said Professor Thompson. "In the future we hope to be able incorporate brain imaging with the global motion perception test to understand how and why these drugs are interacting with the visual parts of our brains."

The children were part of the international IDEAL (Infant Development, Environment and Lifestyle) study, which looked at the effects of prenatal drug and alcohol use on a range of motor and cognitive skills.

More information: Arijit Chakraborty et al. Prenatal exposure to recreational drugs affects global motion perception in preschool children,

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