

# research snapshot

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## Eye Movement and Psychometric Tasks May Help With Early Identification of FASD

### What is this research about?

Prenatal alcohol exposure (PAE) is the leading preventable cause of dysfunction in children. Fetal Alcohol Spectrum Disorder (FASD) is a range of nervous system issues that can result from fetal exposure to alcohol. Children with FASD often show problems with decision making, attention, and working memory. These may lead to negative behavioural and neuropsychiatric problems and an inability to adapt to their environments. Eye movement tests and psychometric tests were used to examine the children. The eye movement task involved the child making saccades. Saccades are rapid eye movements that bring new visual targets onto the fovea of the retina.

### What did the researchers do?

The goal of this study was to compare the performance of children with FASD and PAE to typically developing children. The children with PAE had alcohol exposure but were believed to not be affected enough to have a diagnosis at that time. The researchers wanted to see if a performance-based relationship exists between psychometric tests and eye movement tasks. In other words, does an increase in the number of errors in eye movement tasks correspond to lower scores on psychometric tests?

Participants were aged 5 to 17 years and included those diagnosed with FASD (72), PAE (21), and typically developing children (139). On the test date,

### What you need to know:

Psychometric and eye movement tests allow researchers to point to specific areas of the brain that are affected in children with FASD. These measures may help with early identification of children who would benefit from a more thorough assessment.

participants were asked not to take their medication to remove any conflicting effects. Participants completed a psychometric test called the NEPSY-II which had several subtests. The first examined auditory selective and sustained attention with only one instruction. The second subtest examined how well the children could keep their attention with multiple instructions. The last subtest was inhibition which had 3 conditions: naming, inhibition and switching. These looked at how well the children could inhibit or stop an automatic response with increasing difficulty.

Saccadic eye movement performance was assessed in 2 tasks. The antisaccade task started with the illumination of a central fixation point (FP). The FP disappeared and after a long delay the target would appear to the left or right of the initial FP. Participants had to look towards the opposite side of the screen when the target appeared. In the memory-guided task, participants were told to look constantly at the central FP while 2 targets appeared. After the FP disappeared, they had to make a saccade to the 2 remembered locations in order of appearance.

### What did the researchers find?

Brain injury from PAE results in poor performance on psychometric and eye movement tests. The researchers found that:

- PAE group scores ranged between the FASD and typically developing children's scores.
- The FASD group had problems in response inhibition, as they made a lot of errors on the antisaccade and memory-guided tasks. They were not able to inhibit the automatic response to instead make a voluntary response.
- The PAE group had problems only when tasks were sufficiently complex such as response set which requires additional instructions.
- The FASD group had attention problems on the auditory attention subtest and naming task.
- Inhibition and switching tasks were linked with direction errors in the antisaccade task in the FASD/PAE group.

### How can you use this research?

These inhibition deficits point to impulse control issues in children with FASD which can be reduced or controlled once they are recognized

Eye movement tasks are directly related to the outcome measures used within psychometric tests that diagnose FASD. Thus, they may help with early identification. Practitioners can use these tools to identify children who need immediate interventions while waiting for a full assessment.

Earlier interventions may lead to potentially less severe outcomes, which can be helpful for both parents and their children. Once a child has been assessed, further steps can be taken to improve the overall well-being of the child and their families.

### About the Researchers

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### Keywords

Fetal alcohol spectrum disorder, Prenatal alcohol exposure, Eye movement control, Psychometric testing, Response inhibition, Attention

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