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Seeing through the smoke: Prenatal cannabis exposure impacts functional connectivity of the salience network in children

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Abstract Title: Seeing through the smoke: Prenatal cannabis exposure impacts functional connectivity of the salience network in children

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Background: Prenatal cannabis exposure is associated with cognitive, motor, and social deficits among offspring that last into adulthood; however, the impact on large-scale neurocognitive networks in children is unknown. To address this gap, we leveraged data from the Adolescent Brain Cognitive Development (ABCD) study to examine the impact of prenatal cannabis exposure on functional connectivity in children. We focused on connectivity within and between the salience network (SN) and other key neurocognitive networks in children. The SN is involved in orienting attention to biologically-relevant stimuli and is shown to be disrupted in individuals with psychiatric disorders.

Methods: Neuroimaging data were collected from 10,719 children ($M \pm SD = 9.92 \pm 0.62$ years; 47.9% female), and prenatal cannabis exposure was assessed based on parents' retrospective report. We examined the impact of prenatal cannabis exposure (before or after knowledge of pregnancy) on resting-state connectivity within and between the SN and five other neurocognitive networks.

Results: Four percent of parents reported cannabis use before knowledge of pregnancy and 1% reported use after. Cannabis exposure before (but not after) knowledge of pregnancy was associated with lower within-network connectivity of the SN, and lower connectivity between the SN and ventral attention network.

Conclusion: Prenatal cannabis exposure is associated with disrupted connectivity of brain networks associated with attentional control. We observed lower within-network connectivity of the SN in children prenatally-exposed to cannabis, which is similar to reports in adults with psychiatric disorders. Disrupted SN connectivity may serve as a neural marker of risk to psychopathology and should discourage cannabis use during pregnancy.