

Early childhood household smoke exposure predicts later delinquency and dropout risk at age 12

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Results of a new study led by Professor Linda Pagani of the University of Montreal's School of Psycho-Education show that the more children are exposed to household tobacco smoke in early childhood, the greater their risk of adopting antisocial behavior toward others, engaging in proactive and reactive aggression, having conduct problems at school,

and dropping out at age 12.

"Young [children](#) have little control over their exposure to household tobacco smoke, which is considered toxic to the brain at a time when its development is exponential," said Pagani.

"The detection of early environmental factors that influence later child well-being represents an important target for individual and community health. Parents who smoke near where their children live and play often inadvertently expose them to second and third hand smoke. It was already known that environmental smoke places children at risk of short- and long-term health problems. However, now for the first time, we have compelling evidence which suggests other dangers to developing brain systems that govern behavioural decisions, social and emotional life, and cognitive functioning," she added.

Pagani, her graduate student François Lévesque-Seck, and fellow Professors Isabelle Archambault and Michel Janosz, came to their conclusions after examining data from a longitudinal birth cohort of Quebec boys and girls born in 1997 and 1998. The Quebec Longitudinal Study of Child Development is a public database administered and coordinated by the Institut de la statistique du Québec. Every year, parents of 1,035 children from the [longitudinal study](#) reported whether anyone smoked at home when their children were aged 1.5 to 7.5 years. At age 12, their children self-reported their antisocial behaviour and academic characteristics. Overall, 60 percent of families reported never being exposed to tobacco smoke, while 27 percent reported intermittent exposure, and 13 percent reported chronic exposure. Pagani's team then analyzed the data to identify whether there was a significant link between early household smoke exposure and later signs of child deviance. This was done while eliminating the influence of numerous confounding factors such as exposure to tobacco smoke, drugs, and alcohol during pregnancy, and other parental and family characteristics

that could have explained the observed link between early household smoke and later child deviance.

"Our goal was to eliminate any pre-existing conditions of the children or families that could shed a different light on our results or serve as alternative explanations," said the researcher.

Animal studies have suggested that exposure to tobacco smoke is toxic to the developing brain at a time when it is most vulnerable to environment input. Abnormal brain development can result from chronic or transient exposure to toxic chemicals and gases in second hand [tobacco smoke](#). These compounds eventually solidify and create third hand smoke. Antisocial behavior is characterized by proactive intent to harm others, lack prosocial feelings, and violate social norms. Such behaviors include aggression, criminal offenses, theft, refusal to comply with authority, and destruction of property. In later childhood, [antisocial behavior](#) is often associated with academic problems, as highlighted in the study. Deviance and dropout risk are costly to society as a whole.

"These long-term associations should encourage policy-makers and public health professionals to raise awareness among parents about the developmental risks of second hand smoke exposure. In addition, schools could incorporate this knowledge into curricula at all grade levels in an effort to prevent further [exposure](#) to neurotoxins," she concluded.

More information: L. S. Pagani et al, Prospective longitudinal associations between household smoke exposure in early childhood and antisocial behavior at age 12, *Indoor Air* (2016). [DOI: 10.1111/ina.12353](#)

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