

Aggressive behavior linked specifically to secondhand smoke exposure in childhood

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Children who are exposed to secondhand smoke in early childhood are more likely to grow up to physically aggressive and antisocial, regardless of whether they were exposed during pregnancy or their parents have a history of being antisocial, according to Linda Pagani and Caroline Fitzpatrick of the University of Montreal and its affiliated CHU Sainte-Justine hospital. No study to date has controlled for these factors.

"Secondhand smoke is in fact more dangerous than inhaled smoke, and 40% of children worldwide are exposed to it. Moreover, exposure to this smoke at early childhood is particularly dangerous, as the child's brain is still developing," Pagani said. "I looked at data that was collected about 2,055 kids from their birth until ten years of age, including parent reports about [secondhand smoke exposure](#) and from teachers and children themselves about classroom behaviour. Those having been exposed to secondhand smoke, even temporarily, were much more likely to report themselves as being more aggressive by time they finished fourth grade." The study was published in the *Journal of Epidemiology and Community Health* on May 21, 2013.

Given that it would be unethical to expose children to secondhand smoke, Pagani relied on [longitudinal data](#) collected by Quebec [health authorities](#) from birth onward on an annual basis. Because parents went about raising their children while participating in the study, the data provided a [natural experiment](#) of variations in the [child population](#) of household smoke exposure throughout early childhood. Although no direct causal link can be determined, the [statistical correlation](#) suggests

that secondhand smoke exposure does forecast deviant behavior in later childhood. The very detailed information collated for the Quebec [Longitudinal Study](#) of Child Development enabled her to do something no other researcher has done to date: distinguish the unique contribution of secondhand smoke exposure on children's later [deviant behavior](#).

"Previous studies looking at groups of children have generally asked mothers whether they smoked or not, and how much at each follow-up, rather than asking whether someone smoked in the home where young children live and play," Dr. Pagani said. "Furthermore, few studies have looked at antisocial behaviour in the parents and even fewer have investigated the subsequent influence of prolonged exposure to secondhand smoke over the long term. None have taken into account the fact that disadvantaged families are less likely to participate in a long study like this one, which of course skews the statistics."

The statistics are backed by other biological studies into the effects of smoke on the brain. Secondhand smoke comprises 85% sidestream smoke emanated from a burning cigarette and 15% inhaled and then exhaled mainstream smoke. Sidestream smoke is considered more toxic than mainstream smoke because it contains a higher concentration of many dispersed respirable pollutants over a longer exposure period. "We know that the starvation of oxygen caused by smoke exposure in the developing central nervous system can cause low birth weight and slowed fetal brain growth," Dr. Pagani said. "Environmental sources of tobacco smoke represent the most passive and preventable cause of disease and disability. This study suggests that the postnatal period is important for the prevention of impaired neurobehavioral development and makes the case for the promotion of an unpolluted domestic environment for children."

Provided by University of Montreal

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