

SCIENTIFIC PLAUSIBILITY

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I applaud the authors for attempting to provide some discussion of the scientific plausibility of their inquiry. However, the cursory and largely irrelevant justification to study whether highway pollution on a given day causes violent crime on that day near the highway is inadequate.

The authors acknowledge their lack of expertise: "...we remain agnostic on the underlying mechanism (or mechanisms)."

They then put forth some possibilities. The first is that pollution causes physical discomfort, which in turn causes aggressive behavior. This hypothesis has been primarily applied to temperature. Its relevance to pollution is questionable. In an attempt to do so, the authors cite a study linking malodorous to cognitive function, tolerance and frustration. All of these behaviors are far removed from violent crime. Further, is highway pollution malodorous? All in all this seems like a bridge too far.

A second argument is that pollution reduces serotonin. To substantiate this hypothesis, the authors cite a study that ozone is associated with reduced serotonin. No assessment of whether highway air pollution alters ozone at ground level, the length of exposure to ozone that is necessary, and the extent of the change in serotonin that occurs is provided. To get from there to serotonin to crime, the authors cite studies that low levels of serotonin are associated with aggression and impulsivity. Here too the argument seems like a bridge too far.

A third argument is that pollution inflames nerve tissue. The evidence that this will cause crime is: "Rammal et al. (2008) finds experimental evidence that oxidative stress and similar neuroinflammation increases aggression in mice...". This has to be the longest bridge!

And finally, a "Finally". "Finally, pollution may lead to other physiological changes that manifest in increased aggression." Here they argue that gasoline vapors raise testosterone in rats, which implies that highway pollution causes humans to commit violent crime. No, maybe this is the longest bridge.

The lack of scientific plausibility is not unique to this study. Economists have fallen in love with research design and if an article has what appears to be a "clean identification strategy" then whatever it finds has to reflect a true causal relationship regardless of whether that finding has any plausibility. I suspect that the authors found the rickety scientific justifications after finding the results, or in response to a half-hearted request by the Editor or reviewers to provide

something to bolster the implausible findings that pollution near a highway on a specific day causes only violent crime and not other types of crime on that day and only near the highway.

Do affected individuals (pollution causes them to commit crime) live near the highway? Work near the highway? What criminals live and conduct violent crime near the highway? In fact, results show that aggravated assaults go down on the polluted side of highway, but aggravated battery goes up. So much for the "theory"! And no significant change in rape or homicide between the polluted and unpolluted sides of highway. Is there any use noting that the study never actually measured the relationship between highway pollution and crime rates?

Of course, the study could be viewed as exploratory, but the lack of scientific plausibility would argue against conducting such a study. But the results are stated as causal effects and presented as evidence informative of public policies (again without any scientific plausibility).

Congratulations to authors for getting a good publication. Condolences for science.