

**A few off-the-cuff comments by Steven Pinker to a journalist on the hypothesis that the removal of lead from gasoline in the 1970s caused the Great American Crime Decline in the 1990s:**

It's an intriguing hypothesis that deserves to be taken seriously and studied further. I'd call it "provocative" but "far from proven."

There are reasons to be skeptical of any claim based on correlations between such widely separated variables as lead exposure (the cause) and crime (the effect). Consuming lead does not instantly turn someone into a criminal in the way that consuming vitamin C cures scurvy. It affects the child's developing brain, which makes the child duller and more impulsive, which, in some children, and under the right circumstances, leads them to grow up to make short-sighted and risky choices, which, in some children and under the right circumstances, leads them to commit crimes, which, if enough young people act in the same way and at the same time, affects the crime rate. The lead hypothesis correlates the first and last link in this chain, but it would be more convincing if there were evidence about the intervening links. Such correlations should be far stronger than the one they report: presumably most kids with lead are more impulsive, whereas only a minority of impulsive young adults commit crimes. If they are right we should see *very* strong changes in IQ, school achievement, impulsiveness, childhood aggressiveness, lack of conscientiousness (one of the "Big Five" personality traits) that mirror the trends in lead exposure, with a suitable time delay. Those trends should be much stronger than the time-lagged correlation of lead with crime itself, which is only indirectly related to impulsiveness, an effect that is necessarily diluted by other causes such as policing and incarceration. I am skeptical that such trends exist, though I may not be aware of such studies.

Note that this is the flaw that torpedoed the Freakonomics abortion hypothesis, which also correlated widely separated variables. When you zoom in on the causal chain, the intervening links (e.g., whether girls in crime-prone areas have more abortions), it fell apart.

Note, in contrast, that putative causes such as policing or incarceration are very close to the putative effect: you don't need a whole lot of unproven assumptions to believe that every man behind bars is one fewer man out on the streets committing a crime.

Also, the parallelism in curves for lead and time-shifted crime seem too good to be true, since the lead hypothesis assumes that the effects of lead exposure are greatest in childhood. But 23 years after the first lower-lead cohort, only a small fraction of the crime-prone cohort should be lead-free; there are still all those lead-laden young adults who have many years of crime ahead of them. Only gradually should the crime-prone demographic sector be increasingly populated by lead-free kids. The time-shifted curve for crime should be an attenuated, smeared version of the curve for lead, not a perfect copy of it. Also, the effects of age on crime are not sharply peaked, with a spike around the 23<sup>rd</sup> birthday, and a sharp falloff—it's a very gentle bulge spread out over the 15-30 age range. So you would not expect such a perfect time-shifted overlap as you might, for example, for first-grade reading performance, where the measurement is so restricted in time.

Finally, the most general reason for skepticism about a causal hypothesis based on epidemiological correlations between a widely separated cause and effect is that across times and places, many things tend to go together. Neighborhoods next to smoggy freeways also tend to be poorer, more poorly policed, more poorly schooled, less stable, more dependent on contraband economies, and so on. It's all too easy to find spurious correlations in this tangle – which is why so many epidemiological studies of the cause and prevention of disease (this gives you cancer; that prevents it) fail to replicate.

Once again, none of this means that the lead hypothesis is false; but it does mean we should be skeptical until it is scrutinized by quantitative sociologists and more research on the intervening links has been reported.