How Political Interests Shape the Use of Evidence and Why Strong Science Prevails

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요약 | 본 에세이는 미국 환경보호청(EPA)의 대기질 기준 설정 과정에서 과학적 근거가 어떻게 활용되는지를 분석한 연구를 비전문가 독자를 위해 풀어 쓴 글이다. 분석 결과, 집권 정당의 정치적 성향이 어떤 연구가 정책 평가에 포함되는지에 실질적인 영향을 미치는 것으로 나타났다. 민주당 행정부에서는 규제를 뒷받침하는 연구가, 공화당 행정부에서는 그 반대 성향의 연구가 더 많이 채택되었다. 그러나 학계에서 널리 인용되고 높은 평가를 받는 연구는 정권의 성향과 관계없이 일관되게 정책 평가에 포함되었다. 즉, 과학의 정치화는 실재하지만 과학적 권위가 충분히 확립된 연구는 정치적 압력으로부터 보호된다는 것이 본 연구의 핵심 결론이다.

1. Introduction: Should We Trust the Government to Follow the Science?

We hear it all the time: "follow the science." Governments claim that their policies • on air quality, public health, food safety, environmental protection • are grounded in the best available scientific evidence. But how well does this ideal hold up in practice? When a government agency evaluates thousands of scientific studies and decides which ones to rely on, does the process truly remain neutral? Or does politics creep in, quietly shaping which evidence gets attention and which gets left on the shelf?

These are the questions that motivated my research. The bottom line is this: political bias in the use of science is real and measurable. But the most important, most widely recognized scientific research is remarkably resilient to that bias. The best science endures, even when politics pushes against it.

This matters for all of us. The air quality standards set by the U.S. Environmental Protection Agency (EPA) determine how much pollution is acceptable in the air we breathe. They influence whether new factories can be built near residential neighborhoods and whether power plants must install additional pollution controls. When a child with asthma has a bad day, when an elderly person is hospitalized for heart problems made worse by smog • these outcomes are shaped, in part, by the standards the EPA sets based on its review of the science. If that review process is tainted by political considerations, then the standards may not fully protect public health.

2. The Setting: How the EPA Sets Air Quality Standards

The EPA is responsible for setting National Ambient Air Quality Standards for pollutants that harm human health and the environment. These include ozone (the main ingredient in smog), particulate matter (tiny airborne particles from car exhaust, industrial emissions, and wildfires), carbon monoxide, sulfur dioxide, nitrogen oxides, and lead.

To set these standards, the EPA needs to know what the latest science says about how each pollutant affects people and ecosystems. It does this through a process called Integrated Science Assessments (ISAs)• essentially massive, systematic reviews of the scientific literature. Thousands of researchers worldwide are constantly publishing studies related to air pollution and health: whether children near highways develop asthma at higher rates, whether

ozone increases emergency room visits, or how particulate matter damages lung tissue. The EPA gathers all of these studies, evaluates their quality and relevance, and synthesizes them into a coherent assessment that serves as the scientific foundation for national air quality standards.

This process is governed by the Clean Air Act, which mandates that standards reflect "the latest scientific knowledge." It follows established procedures: a broad initial literature search, expert evaluation, independent peer review, public comment, and publication of a final assessment. Crucially, ISAs for two key pollutants• ozone and particulate matter • were conducted under both Democratic and Republican administrations following a 2008 revision to the review process. This allows me to directly compare how the same type of scientific evidence was treated under different political environments, within the same institutional framework • a kind of natural experiment where the science stays broadly comparable but the political context changes.

3. Finding 1: Political Bias Is Real

The first major finding is clear: the political party in power does influence which scientific studies are included in the EPA's assessments.

The Pattern

Under a Democratic administration, studies that strongly support the link between air pollution and public health harm are approximately **15% more likely** to be cited in the final assessment. This aligns with Democratic administrations' general support for stronger environmental regulations.

Under a Republican administration, the pattern reverses. Studies supporting the pollution-health connection are approximately **18% less likely** to be cited. This aligns with Republican administrations' tendency to favor maintaining or loosening existing standards.

These findings hold up even after accounting for a wide range of factors that might otherwise explain the patterns • including each study's scientific field, publication year, and funding sources.

How Large Is This Effect?

To put these numbers in perspective: the partisan effect is comparable in magnitude to the boost a study gets from being considerably more influential within the scientific community. In other words, having your findings align with the administration's policy preferences can boost your study's chances of being included by about as much as being a far more prominent piece of research. Political alignment, which has nothing to do with the quality or rigor of a study, exerts an influence that rivals the influence of scholarly recognition.

4. Finding 2: Strong Science Is Resilient

If the story ended there, it would be deeply discouraging. But the research reveals a crucial second pattern.

Political bias does not affect all studies equally. It is concentrated among studies with **lower scientific impact** • those that are less well-known and less widely cited by other researchers. For the most highly regarded, widely cited studies, partisan bias largely **disappears**. These high-impact studies tend to be included in assessments regardless of which party is in power and regardless of whether their findings align with the administration's preferences.

Why? Two forces are at work. First, when a study is widely cited and reflects well-established findings, excluding it would be immediately noticed by the scientific community, external reviewers, and courts. The cost of ignoring prominent evidence is simply too high. Second, government agencies care about their credibility. Excluding a well-known study that contradicts the administration's preferred policy invites criticism and litigation. For lesser-known studies, the calculus is different: excluding them is less likely to attract attention and easier to justify.

The key insight is that scientific reputation serves as a genuine check on political discretion • not a perfect one, but a meaningful one.

5. Who Reviews the Science?

A natural question follows: how does political bias enter a process designed to be objective?

Part of the answer lies in personnel. When a new administration takes office, the people involved in the science review process change dramatically. For the particulate matter assessment, approximately 75% of participants under one administration did not continue under the next. For ozone, turnover was approximately 82%.

These changes are not random. Under Democratic administrations, the process drew heavily on **academic scientists** from research universities, often in states that lean Democratic. Under the Republican administration, there were fewer academics and more participants from **state government agencies and regional EPA offices**. The independent advisory committee was particularly affected: its members shifted from university researchers to state and local government officials, and its size was reduced by more than half.

This matters because professional backgrounds and institutional cultures shape how people exercise judgment • especially for studies in the gray area of moderate quality and ambiguous implications. Even with everyone acting in good faith, a team of academic researchers may collectively weight evidence differently than a team of state regulators. It is precisely in this gray area where partisan bias is most consequential.

6. What These Findings Mean

Public debate about science and politics tends to swing between two extremes. One view holds that science provides a perfectly objective basis for policy • we just need to "follow the science." The other holds that science in government is hopelessly corrupted by politics, with findings used merely to justify whatever politicians already wanted to do.

My findings suggest that **neither extreme is correct**. Political bias is real: the party in power influences which studies appear in government assessments, and this influence is measurable and significant. Science in government is not purely neutral. But science is not merely a puppet of politics either. The most rigorous, widely recognized research retains its authority across partisan contexts. There are meaningful limits on how far political actors can distort the scientific record.

Two forces operate simultaneously. **Partisan incentives** push administrators to favor studies that align with their policy preferences • this force is strongest where there is the most room for discretion, among less prominent studies. **Scientific authority** pushes toward the inclusion of well-established research • this force is strongest where consensus is clearest and the cost of ignoring evidence is highest. The interplay between these forces produces partisan bias that is real but bounded, with the boundaries set by the strength of the underlying science.

This has important implications. For **scientists**, producing high-quality, widely recognized work is one of the most effective defenses against political interference. The pursuit of excellence has consequences beyond academia • it contributes directly to the integrity of policymaking. For **citizens**, supporting strong, independent scientific institutions matters. Transparency • like the EPA's publicly accessible databases that made this research possible • enables external accountability. For **policymakers**, the evidence of partisan bias is not a partisan accusation aimed at one side; it is a structural feature affecting both parties. Recognizing this should motivate bipartisan efforts to strengthen protections: ensuring advisory committees remain independent, making study selection criteria more transparent, and basing participant selection on expertise rather than political alignment.

7. Conclusion

Two findings stand together. First, political bias in the government's use of scientific evidence is real. The party in power influences which studies are included in assessments that directly inform standards affecting public health. Second, the best science endures. The most highly regarded research is cited consistently across partisan contexts, because scientific reputation creates genuine constraints on political discretion.

These findings paint a picture that is neither naive nor cynical. The relationship between science and politics is not a simple story of either perfect objectivity or hopeless corruption. It is a dynamic interplay in which both political interests and scientific standards shape the use of evidence • with the balance tilting toward science as the quality and visibility of the evidence increases.

For those who care about the integrity of public institutions, the message is one of guarded optimism. The system is imperfect, and vigilance is warranted. But the pursuit of rigorous, well-recognized science is not futile. It is one of the most effective tools we have for ensuring that evidence-based policymaking lives up to its name.

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