Who Refers to Science?

Understanding the Salience of Scientific Evidence in Parliamentary Debates

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Abstract

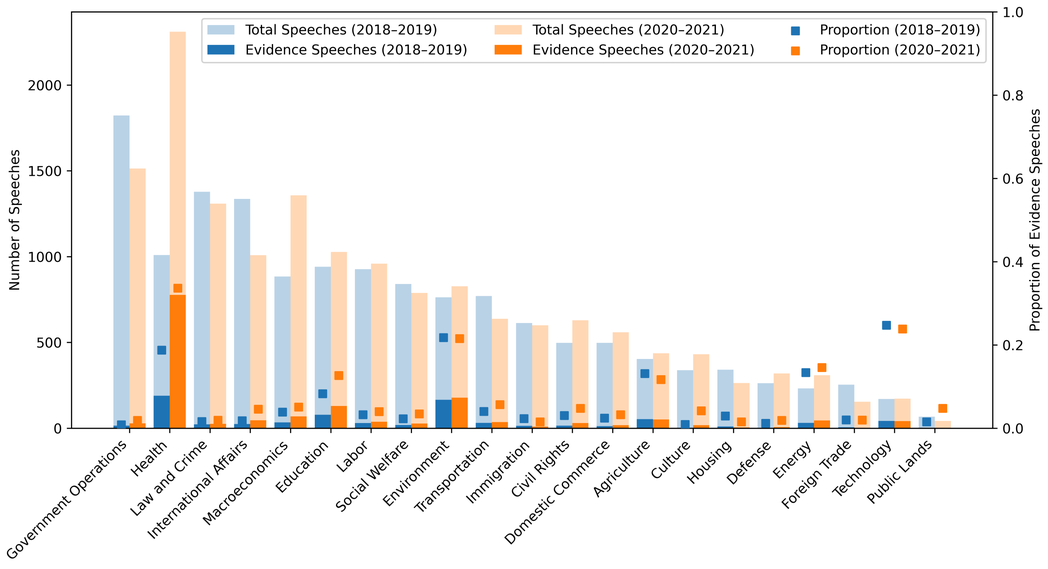
Effective politics relies on the availability and use of factual information. However, while theoretical and normative discussions often stress the importance of evidence-based politics, empirical studies of how often and under what conditions politicians refer to scientific evidence remain limited. This study aims to fill this gap by analyzing references to scientific evidence in one important political arena: parliamentary debates. Our dataset covers 30,000 speeches delivered in the main legislative chambers across six European democracies (Austria, Czechia, Denmark, Finland, Italy, and the United Kingdom) from 2018 to 2021. Using large language models (LLMs), we identify two key features in each speech: (1) the use of scientific evidence, and (2) the primary policy issue discussed. We then apply multi-level logistic regression models to evaluate which factors are associated with higher or lower likelihoods of references to scientific evidence. We distinguish between three sets of predictors: (a) macro-level country variables, (b) meso-level party and issue factors, and (c) micro-level speaker characteristics. Findings suggest that institutional roles, policy contexts, and organizational routines are more decisive for evidence use in politics than national context or ideology.

Scientific Evidence in Politics

Democratic theory and political science have long debated the extent to which scientific expertise should guide political decisions, with "evidence-based" policymaking emerging as a normative ideal [1], [2] that is sometimes also contested [3], [4]. Existing research predominantly relies on case studies in specific policy fields, leaving a gap in systematic data on how prevalent scientific evidence use actually is across policy fields, countries, or political parties [5], [6], [7].

> *Scientific evidence references are understood as any appeal to science as an external source of epistemic authority to support a claim.*

This comparative gap is further compounded by a reliance on finalized policy documents, which (1) only capture a fraction of references to scientific evidence in politics and (2) obscure the dynamic and manifold ways in which scientific evidence enters political debate [8], [9]. This paper addresses these gaps by analyzing references to scientific evidence in parliamentary debates, which provides a unique window into the argumentative use of scientific evidence in politics.



Policy issues differ substantially in how often they trigger references to scientific evidence. Health, Technology, Environment, Energy, Agriculture, and Education show the highest proportions — while Macroeconomics, Social Welfare, and Labor remain consistently low. A pronounced temporal effect emerges only for Health, where references increase sharply after the COVID-19 outbreak, and to a lesser extent for Education. The proportion of speeches containing references to scientific evidence for all other issues remains stable.

Methods

The analysis included 30,000 speeches from the ParlaMint 4.1 corpus [10], with the sample stratified to 5,000 per country. Through LLM-based classification (GPT-4o), each speech was coded to evaluate (1) whether it contains references to scientific evidence, and (2) the primary policy issue discussed. Then multi-level logistic regression models were applied to evaluate which factors are associated with higher or lower likelihoods of references to scientific evidence.

	AT	CZ	DK	FI	IT	UK
R&D Investment (% of GDP)	3.29	1.83	2.99	3.09	1.31	2.64
Public Science Trust	3.42	3.44	3.77	3.68	3.38	3.82
Speech Length *M*	553.75	341.18	216.97	211.36	626.31	192.26
Speeches w/ Evidence %	**10.8%**	**6.0%**	**5.1%**	**8.9%**	**11.4%**	**5.5%**

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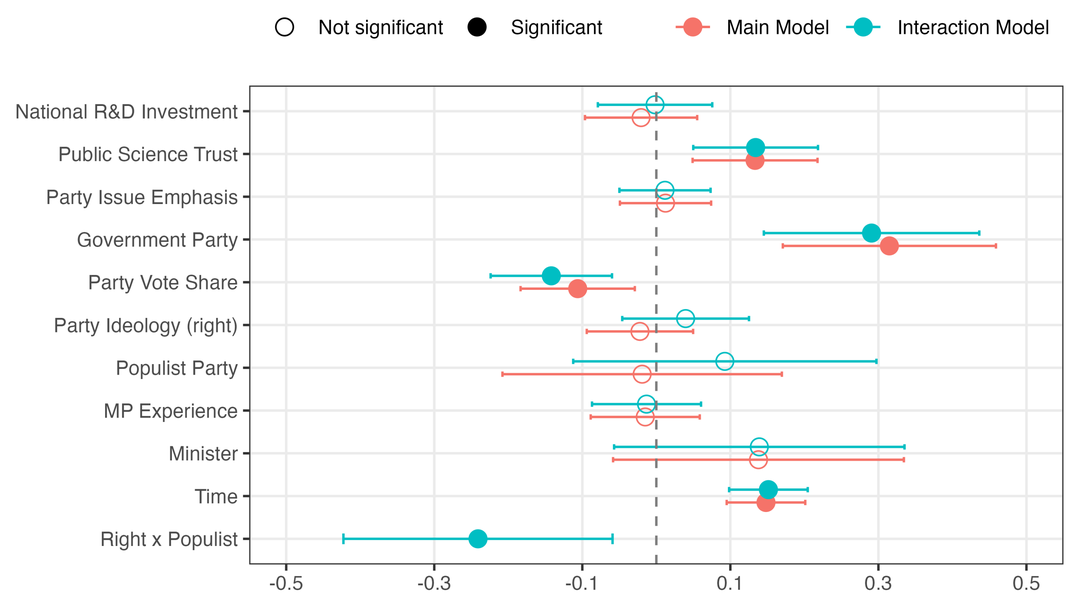
Results

Among the *macro-level* predictors, *public trust in science* emerges as a significant predictor ($\beta = 0.133, p < .01$). Countries with lower trust in science tend to show fewer references to scientific evidence in parliamentary debates and vice versa. At the party level, *issue emphasis* did not show significant effects. While policy issues differ in their overall likelihood of references to scientific evidence, a party's stronger emphasis on a given issue does not influence its use of scientific evidence. *Government membership* was the strongest and most consistent predictor. Being part of the government significantly increased the likelihood of referencing scientific evidence ($\beta = 0.315$, $p < .001$). Substantively, this may reflect government parties' access to broader institutional resources, which foster a more frequent use of scientific evidence. Conversely, *party vote share* did show significant negative effects ($\beta = -0.106, p < .01$). The significant time effect is mainly driven by an increase in health-related debates after the COVID-19 outbreak ($\beta = 0.148, p < .001$).



① Societal Context Matters
Higher public trust in science leads to more frequent references to scientific evidence in parliamentary debates.

② Institutional Role Is Decisive
Government parties refer to scientific evidence significantly more often than opposition parties.

③ Party Size Matters
Larger parties with higher vote share refer to scientific evidence less often than smaller parties.

Turning to ideological predictors, the economic *left-right* orientation of parties did not show a significant main effect on the probability of referring to scientific evidence, nor did *populism* alone.

The interactions between economic *left-right* position and *populism* reveal a differential pattern: left-populist parties refer to scientific evidence much more often than right-populist parties, and non-populist parties across the left–right spectrum. Right-wing populist parties exhibit the lowest overall probability of referring to scientific evidence in their speeches. Among non-populist parties, there is a slight tendency for those positioned further to the right on the economic scale, such as liberal or Christian democratic parties, to refer more frequently to scientific evidence. This finding adds conceptual nuance to the role of ideology in the use of scientific evidence.

Discussion

The findings reveal several key insights into how scientific evidence is used in parliamentary discourse. First, the policy issue discussed is the strongest determinant. While evidence is frequently cited in areas such as health, environment, and technology, its limited use in domains like macroeconomics, labor, or immigration is striking and warrants both further research and critical reflection on why scientific evidence is not used more in such important fields. Second, institutional factors matter: government membership increases evidence use, whereas higher party vote share decreases it, suggesting that established routines rather than plain resources drive engagement with science. Public trust in science also positively affects references to scientific evidence, highlighting the role of societal attitudes and expectations. Third, ideology shows a conditional effect. Although left–right positioning alone is insignificant, its interaction with populism reveals that left-populist parties rely most on scientific evidence, while right-populists rely least. Finally, evidence use increased after the COVID-19 outbreak, but mainly within health debates, leaving the overall role of scientific evidence in parliamentary discourse unaffected.

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