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POLITICIZED SCIENTISTS: CREDIBILITY COST OF POLITICAL EXPRESSION ON TWITTER

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As social media becomes prominent within academia, we examine its reputational costs for academics. Analyzing Twitter posts from 98,000 scientists (2016–22), we uncover substantial political expression. Online experiments with 4,000 U.S. respondents and 135 journalists, rating synthetic academic profiles with different political affiliations, reveal that politically neutral scientists are seen as the most credible. Strikingly, political expressions result in monotonic penalties: Stronger posts reduce perceived credibility of scientists and their research and audience engagement more, particularly among oppositely aligned respondents. Two surveys with scientists highlight their awareness to penalties, their perceived benefits, and a consensus on limiting political expression outside their expertise.

KEYWORDS: Twitter, Scientists' Credibility, Polarization, Online Experiment.

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1. INTRODUCTION

In a "post-truth" era, trust in science is a cornerstone of informed decision-making and effective public policy (McIntyre, 2018, Angelucci and Prat, 2024, Bursztyn et al., 2023b, Arold, 2024, Ash et al., 2024). The COVID-19 pandemic highlighted this reality, illustrating how confidence in scientific expertise shapes public health responses. Similarly, climate skepticism hinders progress toward environmental goals.[1] Skepticism extends beyond these domains, affecting economic development, education, and societal trust more broadly.

Credibility is essential to science, yet public trust is at a relative low, particularly among U.S. conservatives.[2] A key driver of distrust is the perception of political bias among scientists (Altenmüller et al., 2024), amplified by the accessibility of their social media activity, where nearly half of academic content engagement comes from non-academics (Mohammadi et al., 2018, Maleki and Holmberg, 2024).

This paper proceeds in two parts. First, we use Large Language Models (LLMs) to measure the extent and nuance of scientists' political expression on social media. Second, we assess whether their online political engagement affects public perceptions, focusing on the reputational costs for scientists as public opinion makers (Aina, 2023) shaping individual preferences and behaviors (Algan et al., 2021, Burnitt et al., 2024, Martinez-Bravo and Stegmann, 2022). Using an online experiment, we evaluate how revealing scientists' political views on social media influences perceptions of their credibility and contributes to audience polarization.

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[1] Higher trust in science is linked to earlier adoption of preventive measures during COVID-19 (Algan et al., 2021, Allcott et al., 2020, Bartoš et al., 2022, Bowles et al., 2023, Eichengreen et al., 2021), whereas skepticism has driven reliance on unverified remedies, such as those documented in Argentina (Calónico et al., 2023, Albornoz et al., 2024). On climate change, Druckman and McGrath (2019) highlights how differing beliefs about credible evidence influence policy support.

[2] Nichols (2017) discusses hostility toward expertise in the U.S., while Lupia et al. (2024) documents declining trust in science among U.S. respondents. Factors include misinformation (West and Bergstrom, 2021, Roozenbeek et al., 2020), historical failings (Scharff et al., 2010), the reproducibility crisis (Hendriks et al., 2020), conspiracy theories (Rutjens and Većkalov, 2022, Douglas, 2021), science-related populism (Mede and Schäfer, 2020, Mede et al., 2021), and political ideology (Cologna et al., 2025), with U.S. conservatives reporting lower trust in scientists, stronger anti-science attitudes, and less confidence in their intentions and methods (Mede, 2022, Funk et al., 2020, Li and Qian, 2022, Azevedo and Jost, 2021).

Our findings reveal evidence of both *ideological* polarization (divergent political positions among academics) and *affective* polarization (public aversion to scientists associated with opposing partisan groups) (Lelkes, 2016, Barberá, 2020). The central questions of our study are: *To what extent do scientists express polarized political opinions on social media? And what impact does this political expression have on their perceived credibility?*

Impact is increasingly crucial for academics, with social media playing a growing role in research dissemination and public engagement. Studies suggest that social media engagement can benefit academics (Chan et al., 2023, Klar et al., 2020, Qiu et al., 2024, Boken et al., 2023), and Altmetric data reveal a significant rise in the online presence of scientific research from prominent journals between 2011 and 2020, particularly on social media.[3] Our study extends this perspective, examining how scientists use social media not just to share research but to engage in politically salient discussions, assessing the implications for credibility and public polarization.

First, we build on Garg and Fetzer (2024) by analyzing the extent of online political discourse and issue-based disagreement among U.S. scientists (university-based researchers) compared to general social media users. Examining political slants on social media offers three key advantages: (i) capturing a large, cross-disciplinary sample of academics, (ii) providing a nuanced view of ideological positions beyond a left-right spectrum, and (iii) focusing on publicly visible content, avoiding the limitations of survey-based or publication-based classifications.

Our descriptive analysis reveals that 44% of 97,737 U.S. academics on Twitter expressed political opinions by making at least one non-neutral post on any of five politically salient topics—(i) abortion rights, (ii) climate action, (iii) immigration, (iv) income redistribution, and (v) racial equality—between 2016 and 2022, compared to only 7% of the general non-academic U.S. Twitter base.[4] Political engagement is consistent among disciplines and topics. Notably, 29% of academics' tweets on these issues are research-related, but only 7% of all research-based tweets mention these topics, reflecting a significant intersec-

[3]While this trend may partly reflect overall social media growth, our data suggest a specific surge in the visibility of scientific research online. Altmetric tracks research impact across diverse outlets—newspapers, blogs, social media platforms, policy briefs, patents, and traditional citations.

[4]These topics are identified as the most salient in U.S. political debates by Gallup and Pew Research.

tion between research and political discourse. Academics adopt more neutral positions in research-related tweets but express more explicit stances in non-research tweets. Original posts are also less explicit than retweets, and high-reach academics tend to adopt more moderate stances.[5] Positions have also shifted over time, with racial equality standing out: disagreement among academics is both more pronounced and widening compared to general users.[6]

According to Morris (2001), engaging in "politically incorrect" communication can result in reputational loss, as audiences may draw adverse inferences about the speaker. Since such reputational concerns can lead to information loss, the second part of our paper quantifies this cost through an online experiment with a representative sample of 1,700 U.S. respondents.[7] In the experiment, respondents rated vignettes featuring synthetic academic profiles, which varied in political affiliation—based on real tweets—and other attributes, following Kessler et al. (2019). They assessed each scientist's personal credibility, the credibility of their research, and their willingness to engage with their content. This conjoint design allows us to isolate and precisely estimate the effects of political expression on public perceptions, offering more experimental control than a Twitter-based approach.[8]

Findings reveal a significant *credibility penalty* for scientists who engage in political discourse, regardless of political orientation. Scientists expressing either left- or right-leaning views face a monotonic decline in *personal credibility* (first outcome): Strong Republicans are rated 39% less credible than neutral scientists, Strong Democrats 11% less; Moderate

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[5] These patterns highlight the sensitivity of our classification in capturing the intensity of political expression.

[6] This trend of increased political activism among scientists has been linked to events like the March for Science (Russell and Tegelberg, 2020, Campbell et al., 2023).

[7] The broader welfare implications of expert communication are complex. Chakraborty et al. (2020) distinguish between partisan endorsements (post-platform choice) and policy advocacy (pre-platform choice). While endorsements may reduce voter welfare by distorting platforms, these distortions can incentivize experts to provide informative policy advice—unless the conflict between expert and voter preferences is too large. Moreover, despite potential reputational costs, scientists can also benefit professionally from social media, including citation premiums (Chan et al., 2023, Klar et al., 2020) and improved recruitment outcomes in the academic job market (Qiu et al., 2024).

[8] Conjoint designs have been used to study medical decisions (Chan, 2022), repugnant transactions (Elías et al., 2019, Sullivan, 2021), financial choices (Macchi, 2023), dating preferences (Low, 2014), and charitable donations (List and Lucking-Reiley, 2002).

Republicans and Democrats are rated 9% and 7% less credible, respectively. This penalty extends to the *credibility of their academic work* (second outcome), indicating that reputational costs go beyond personal perception and exceed standard in-group bias. It also translates into lower public *willingness to engage with their work* (third outcome): respondents are 42% less willing to read opinion pieces from Strong Republicans, 10.7% less for Strong Democrats, and 8% and 4.5% less for Moderate Republicans and Democrats, respectively, compared to neutral scientists. All effects are statistically significant at the 1% level.

Credibility penalties reflect a strong partisan bias: respondents mainly perceive scientists aligned with opposing political views as less credible. Democrat respondents rate neutral and Democrat-leaning scientists similarly but lose trust in Republican-leaning ones. Republican respondents generally prefer moderately Republican scientists to neutral, while still penalizing strongly conservative profiles—though less so than they penalize Democrat-leaning scientists. These patterns suggest that scientists' political discourse can serve as a channel for polarizing public perceptions and reducing engagement with scientific content, depending on audience ideology.

Among other tested attributes, scientists from highly ranked institutions and those in senior positions are perceived as more credible, while gender and field have no significant effect. Notably, political affiliation emerges as the most salient factor shaping public perceptions of scientists.

We conducted several robustness checks. First, we replicated our main findings with a separate sample of 2,000 U.S. respondents, confirming that results hold under a different outcome structure. We also found minimal carryover effects across profiles, and results remain stable after excluding "speeders" and adjusting for multiple hypothesis testing. A permutation test and a validation task with new respondents confirmed that participants accurately identified the intended political affiliations of scientists in the vignettes. Finally, we bounded potential experimenter demand effects and found that any such influence is minimal and cannot account for our results.

To assess external validity, we tested whether the *credibility penalty* for politically engaged scientists extends to journalists—an important audience, as they regularly cover scientific research and interview scientists (Alabrese, 2022). Among 135 international journalists surveyed, we observed clear asymmetries: Republican scientists were rated 33% less credible than neutral ones, and their opinion pieces were 40% less likely to be included in newsletters. By contrast, Democrat scientists were rated only 5% less credible and 2% less likely to be featured—effects that are statistically indistinguishable from zero, likely due to the overrepresentation of liberal journalists. Partisan bias was evident: Liberal journalists were 7, 9, and 5 times less likely to rate a Republican scientist's credibility, research, and newsletter inclusion favorably compared to a Democrat. Conservative journalists showed a comparable bias in the opposite direction, being 4, 9, and 7 times less likely to favor Democrat scientists across the same dimensions.[9]

According to the sender-receiver framework in Gentzkow and Shapiro (2006), a sender who fails to align their message with the receiver's prior beliefs incurs a greater credibility penalty—especially when the quality of the sender cannot be easily verified ex post. For scientists, this penalty may arise in two ways: when discussing politically charged research topics that conflict with readers' views (leading audiences to infer political bias) or when signaling a political identity cue unrelated to research (which may elicit affective polarization). To investigate these channels, we conducted an additional experimental task after the conjoint experiment. This between-subject task isolates the credibility effects of (i) tweeting about politically salient research that may implicitly signal ideological bias versus (ii) explicitly signaling political affiliation through unrelated political cues. We held the research message constant, varied the political signal in an otherwise uninformative bio, and restricted all profiles to economists to keep expertise constant.

Both mechanisms—sharing politically salient research and signaling political identity—independently shape public perceptions. First, we find that merely tweeting about politically charged research influences credibility: Democrats view economists more favorably when the research aligns with their political views, while Republicans rate economists lower when the research content is misaligned. These credibility shifts occur even in the absence of any explicit political signaling. Second, adding a political identity cue amplifies these effects. Among Democrats, a left-leaning bio further increases credibility, while a right-leaning one sharply reduces it. For Republicans, the pattern reverses: left-leaning signals exacerbate the credibility penalty for misaligned research, while right-leaning signals

[9] This aligns with findings from Boxell and Conway (2022), who show that 16% of slant variation across outlets can be explained by journalist preferences.

moderate it. These effects extend to newsletter demand—a behavioral measure of audience engagement curated following (Chopra et al., 2022, 2024)—where alignment between the audience's political views and the scientist's signal strongly predicts sign-ups. Together, these findings confirm that both inferred ideological bias (based on research content) and affective polarization (based on identity cues) contribute to audience reactions, shaping who the public trusts and engages with.

What do scientists think? We surveyed 128 international scientists on Prolific to assess whether they anticipate the credibility penalty observed in our experiment and to understand their views on political expression online. Scientists expected a larger penalty than what we observed and considered it more acceptable to express political opinions within their area of expertise than outside it—a norm they believe to be widely shared among academics. Many reported hesitating to share political views on social media, suggesting a potential for information loss in public discourse (Morris, 2001, Ottaviani and Sørensen, 2006). While they anticipated mild reputational costs for commenting on topics outside their field, they saw modest reputational benefits when engaging within their expertise. However, perceptions of costs and benefits largely overlapped. To examine this further, we conducted a follow-up survey with 118 additional international scientists. Respondents perceived clear professional benefits of political expression for media appearances and policy roles, smaller benefits for network size and citations, and ambiguous or slight costs for top journal publications and academic job offers.

Contribution to the Literature Our findings deepen our understanding of how the public perceives scientists and their communication (Altenmüller et al., 2024, Blastland et al., 2020, Norris, 2020). Prior work has explored how uncertainty and political transparency affect trust in science (Van Der Bles et al., 2019, 2020, Petersen et al., 2021). For example, Kotcher et al. (2017) found that climate scientists' advocacy generally did not reduce credibility, except when promoting nuclear power. Zhang (2023) showed that political endorsements by scientific journals—such as Nature's support for Joe Biden—can polarize perceptions of publishers and science more broadly, particularly among Republicans.

We extend the most directly related work by Zhang (2023) in several key ways. Rather than focusing on editorial decisions by publishers—which may reflect institutional rather than individual scientist preferences—we provide robust, large-scale observational evidence on political discourse among scientists themselves, across disciplines and over time. We then causally identify the reputational impact of scientists' political expression through online experiments, allowing us to distinguish between credibility effects driven by research on politically charged topics and those driven by personal political signals. Beyond this, our study contributes along several additional dimensions: we incorporate behavioral outcomes such as newsletter sign-ups; extend external validity by testing effects among journalists; and explore scientists' motivations for political expression through survey evidence.

More broadly, we contribute to the literature on the communication—or absence—of politically salient topics in the U.S., including the "spiral of silence" (Huang and Ho, 2023), both offline (Braghieri, 2024) and online (Bursztyn et al., 2023a). This literature focuses on decisions to voice controversial opinions and their downstream effects. To our knowledge, this is the first study to examine U.S. academics' online communication on politically charged topics and its impact on public perceptions. We also contribute to work on politically motivated reasoning in the acquisition (Chopra et al., 2024, Faia et al., 2024) and interpretation (Gentzkow et al., 2023, Thaler, 2024) of information, by showing how political affiliation mediates responses to scientists' views.

We further relate to the growing literature using text-as-data to measure political ideology from sources such as official documents (Ash, 2016, Hansen et al., 2018, Grimmer, 2010), online news (Cagé et al., 2020), product descriptions (Fetzer et al., 2024), political speeches (Jensen et al., 2012, Gentzkow et al., 2019), academic publications (Garg and Fetzer, 2025, Jelveh et al., 2024, Brown and Gupta, 2023), and surveys (Draca and Schwarz, 2024). Our study builds directly on (Garg and Fetzer, 2024), who show that scientists' political expression differs from that of the general public in both topic and tone, with public narratives often shaped by highly visible but less academically impactful scientists. We extend this work by analyzing polarization in political discourse among U.S. academics and causally identifying the reputational risks of political engagement, which vary sharply by audience ideology.

Our findings contribute to broader evidence on ideological and affective polarization in the U.S., documenting how echo chambers can deepen public divides (Canen et al., 2020, 2021, Fiorina and Abrams, 2008, Alesina et al., 2020, Iyengar et al., 2019, Gentzkow and Shapiro, 2011, Levy, 2021, Chopra et al., 2024, Mosleh et al., 2021, Colleoni et al., 2014, Flaxman et al., 2016, Stewart et al., 2019, Boxell et al., 2024, Kahan et al., 2011). Finding that individuals gravitate toward scientists whose views align with their own—and discount misaligned voices as less credible—highlights the need for strategies to reduce polarization while preserving the integrity and reach of scientific discourse.

Additionally, our work contributes to the literature on social identity, originally developed by Tajfel and Turner (2003) and later incorporated into economic analysis by Akerlof and Kranton (2000) and Shayo (2009, 2020). Recent research has examined how social identity shapes economic behavior in areas such as trade policy (Grossman and Helpman, 2021), teamwork (Charness and Chen, 2020), bonus acceptance (Bursztyn et al., 2020), policy adoption (Garcia-Hombrados et al., 2024), and everyday interactions (Braghieri et al., 2024). Party affiliation increasingly influences individual choices beyond politics, including decisions about marriage (Alford et al., 2011), dating (Huber and Malhotra, 2017), residential location (Brown et al., 2022), career path (Chinoy and Koenen, 2024), medical treatment (Kim, 2024), and even food preferences (Burnitt et al., 2024). Our findings show that scientists' social identity—specifically their political identity—reduces their perceived credibility, the credibility of their research, and the public's willingness to engage with their communication.

While our study is not a real-time Twitter experiment, it relates to recent experimental work on interventions to reduce misinformation, toxicity, and discrimination online (Guriev et al., 2023, Jiménez Durán, 2022, Beknazar-Yuzbashev et al., 2022, Angeli et al., 2022, Ajzenman et al., 2023a,b). We also contribute to the broader literature on the political effects of the internet and social media, including their role in shaping voting behavior, protests, polarization, and misinformation (see Zhuravskaya et al., 2020, for a review). Our focus, however, is on the reputational risks of the growing role of social media in academic communication.

The remainder of the paper is organized as follows. Section 2 examines the political engagement of a large sample of U.S. academics on Twitter. Section 3 experimentally tests how political expression affects public perceptions of scientists' credibility and engagement with their content. Section 4 presents survey evidence on scientists' own views about political expression online. Section 5 concludes.

2. SCIENTISTS' ONLINE POLITICAL EXPRESSION

Given the growing emphasis on academic impact, we assess whether social media is increasingly vital for scientific dissemination. We track the online diffusion of over 100,000 Scopus-indexed articles published from 2011 to 2020 in top general interest and life-science journals using Altmetric data (Alabrese, 2022, Peng et al., 2022).[10] Figure 1, Panel A, shows a steady rise in online presence, particularly on Twitter, where over 96% of articles are mentioned. Panel B further shows that the distribution of Twitter mentions has become less skewed towards zero with a thicker right tail and more high-mention outliers over time, indicating increasing variability in social media attention.

These trends highlight Twitter's growing role in scientific communication while also increasing public visibility into scientists' social media activity. Since about half of those engaging with academic content on Twitter are non-academics (Mohammadi et al., 2018, Maleki and Holmberg, 2024) and that perceptions of political bias among scientists contribute to distrust in science (Altenmüller et al., 2024), in this section we leverage Large Language Models (LLMs) to cost-effectively measure the extent and nuance of scientists' political expression on social media.

2.1. *Academics on Twitter: Sample and Method*

We analyze political discourse and ideological polarization among 97,737 U.S. academics on Twitter from 2016 to 2022, a substantial subset of the 683,050 U.S. research-active academics (National Center for Education Statistics, 2020). These academics gather significant attention to their online content, averaging 6,093 likes (SD = 6093) and 1,101 retweets (SD = 1100.9) per post (medians: 1,376 likes, 272 retweets), with even higher averages for politically salient tweets (e.g., 7,168 likes and 1,210 retweets, SD = 7168 and 1,209.8; median: 1,978 likes, 405 retweets). These university-based researchers were identified by Mongeon et al. (2023) by matching authors' OpenAlex IDs to Twitter/X accounts via Crossref Event Data. Their method achieved high precision and moderate recall by identifying authors who tweeted their own research. Building on Garg and Fetzer (2024), we use their merged dataset of Twitter timelines and OpenAlex records, employing LLMs

[10] Of the 114,868 articles published between 2011 and 2020 in *Science*, *Nature*, *PNAS*, *Cell*, *NEJM*, and *Lancet*, 107,008 were tracked by Altmetric as of November 10, 2021. See Appendix 3 for details.

to detect whether tweets address specific salient topics and to classify stances of posts as pro, anti, or neutral towards those topics.[11]

Our dataset comprises approximately 116 million tweets (original tweets, retweets, quote retweets, and replies) from these academics, and our analysis focuses on five politically salient issues: Abortion Rights, Climate Action, Racial Equality, Immigration, and Income Redistribution.[12] The procedure involves two key steps. The first is *topic detection*. OpenAI's GPT-4 was used to generate dynamic keyword dictionaries designed to capture the evolving discourse on each topic. The model was prompted with:

`Provide a list of [`*`ngrams`*`] related to the topic of [`*`topic`*`] in the year [`*`year`*`]. [`*`Twitter Fine Tuning`*`].`
`Provide the [`*`ngrams`*`] as a comma-separated list.`

The `[`*`Twitter Fine Tuning`*`]` either explicitly instructed the model to `'Focus on language, phrases, or hashtags commonly used on Twitter'`, ensuring the dictionary remains contextually relevant to the platform's discourse or was left empty. This process, spanning 5 topics × 3 n-gram types × 7 years × 2 vernacular adjustments (210 prompts), yields five comprehensive keyword dictionaries applied to the full corpus of tweets. Tweets containing any keyword from a topic's dictionary were labeled as belonging to that topic (e.g., tweets mentioning "Paris Agreement" are labeled under Climate Action). The topic detection captures 5.31% (around 6.15 million) of the initial 116 million tweets. Climate Action was the most discussed topic (2.09% of all tweets), followed by Racial Equality (1.50%) and Immigration (0.86%).[13]

The second step is *stance detection*. Using OpenAI's GPT-3.5 Turbo, topical tweets were classified into three discrete categories: "pro," "anti," and "neutral." The classification used the following prompt:

`Classify this tweet's stance towards [`*`topic`*`] as 'pro', 'anti', 'neutral', or 'unrelated'. Tweet: [`*`tweet`*`].`

[11]Comprehensive individual-level, time-series data are publicly available here.

[12]We identified salient issue based on Gallup survey. Gallup's list is available here.

[13]Using GPT-4 on all tweets would be prohibitive, so we focus on using GPT-3.5 Turbo on the set of topical posts for stance detection.

This process not only identifies the position of each tweet on a specified topic but also enhances precision and relevance by filtering out unrelated tweets. To reduce costs, we sampled up to three random tweets per author, month, and topic (99.55% had one tweet; 0.45% had two; 0.004% had three), ensuring adequate coverage and reliable stance estimation. See Appendix Table V for examples on each topic-stance, posts-level summary statistics in Appendix Table II and details on validation in Appendix Section 4.

Appendix Table I summarizes the key characteristics of our sample of academics. Most scientists are in STEM, followed by Medicine and Social Sciences. 54% of U.S.-based academics discussed at least one topic, and 81% of those expressed non-neutral stances. Our analysis thus focuses on 42,747 scientists who posted non-neutral topical tweets.

We call *politicized* the scientists who express a non-neutral stance on any salient topic. Our focus on non-neutral communication offers several advantages: first, it maps naturally from our methodology; second, it broadly identifies the presence of academic discourse related to political issues. Such discourse may enable the public to infer scientists' political leaning and update the perception of their credibility—a central concern addressed in the second part of this paper.

Appendix Table I further breaks down the proportion of politicized scientists by key characteristics. The proportion remains relatively stable across categories of academic recognition (between 41% and 46%).[14] Disciplinary differences are more notable, with higher proportions in Humanities (58%) and Social Sciences (65%) versus STEM (43%) and Medicine (38%). Some gender differences also emerge, with 50% of female scientists and 40% of male scientists being vocal. More details are provided in Section 2.2.2.

2.2. *Academics Political Engagement on Twitter*

Figure 2 compares political discourse trends between academics (orange) and a random sample of approximately 100,000 U.S. Twitter users (blue) between 2016 and 2022.[15] The

[14]Cumulative citation categories: <100; 101–500; 501–1,000; >1,000. Categories are derived from the following distribution: 25th percentile = 36, median = 190, mean = 1205, 75th percentile = 849.

[15]Twitter users were originally sampled by Siegel et al. (2021). Their method randomly generated user IDs and filtered for active accounts with geographic metadata indicating U.S. residency, based on time zone or location fields referencing U.S. states or major cities.

top-left panel ("All") shows that well over one-third of the 97,737 tracked U.S. academics express a non-neutral opinion on any specified salient topic in each month, revealing a substantial gap compared to general users.[16]

Breaking the trend down by topic, Climate Action and Racial Equality—the most frequently discussed issues—are the largest contributors to the gap. Notably, Climate Action discourse declined at the onset of the COVID-19 pandemic, while Racial Equality remained highly salient, surging in mid-2020 following the George Floyd incident and widespread protests. Abortion Rights discussions spiked in 2022 due to changes in abortion laws, and Immigration conversations peaked around the 2016 presidential election and diminished over time.

2.2.1. *Overlap with Politics and Research*

To understand the interplay between scientific discourse and political engagement, we analyzed how academics discuss both research and politically salient issues. Following the methodology in Section 2.1, we used GPT-4o to generate dictionaries for detecting mentions of `[scientific research papers]`. Additionally, we generated dictionaries for `[Donald Trump]`, `[Joe Biden]`, `[Politicians]`, and `[Political Candidates]`. These were combined to create a comprehensive dictionary for identifying mentions of political figures (see Appendix Table III for examples).

We then examined the yearly distribution of academics' tweets across four categories: tweets mentioning politicians (blue), research papers (green), both (pink), and other content (grey). Appendix Figure 1 shows that, on average, 10% of tweets mention politicians, 20% reference research papers, and about 1% mention both. These proportions remain relatively stable over the years, with fluctuations likely tied to significant events (e.g., larger coloured areas in 2020 may reflect discussions post-George Floyd or a COVID–19–induced surge in research tweets). Darker shades mark tweets addressing the five salient issues—Abortion Rights, Climate Action, Racial Equality, Immigration, and Income Redistribution—which largely fall in the residual grey category.

These findings align with the cross-sectional summary statistics in Appendix Table II: overall, 9.8% of tweets mention politicians and 19.2% mention research papers; when re-

[16]Monthly aggregated scatter plots are smoothed using LOESS (span=0.5) with shaded standard errors.

stricted to the five salient topics, these rise to 16.0% and 28.9%, respectively. Notably, Climate Action tweets mention research papers 44.5% of the time versus 15% for politicians (a roughly 3:1 ratio), while Abortion Rights and Immigration tweets favor mentions of politicians (25.6% and 28%) over research papers (15% and 21.4%), with ratios of approximately 1.7:1 and 1.3:1.

Overall, the data suggest that scientists engage in discussions about research, political figures, and politically salient issues, with a moderate overlap between these domains. Given that politically salient tweets generate high engagement and research-related discourse is increasingly prevalent on Twitter (see Figure 1), it is important to assess the impact of this communication on public perceptions.

2.2.2. *Differences by Gender and Discipline*

We examine variation in academics' online political expression by gender and discipline. Gender was determined via a binary LLM classification (Appendix Figure 2).[17] Academics with female-labeled names express slightly more political opinions—especially on Abortion Rights, Immigration, and Racial Equality (with notable increases post-2020)—while no significant gender differences appear for Climate Action and Income Redistribution.

We also assess disciplinary differences using OpenAlex "Concepts." Each publication is scored on 19 root concepts; for each researcher, we average these scores over the entire period and assign the primary concept to one of three groups: Medicine, Social Sciences (Business, Economics, History, Political Science, Psychology, Sociology), or STEM (Biology, Chemistry, Engineering, Environmental Science, Geography, Geology, Materials Science, Mathematics, Physics). Figure 3 shows that, overall, U.S. academics express political views beyond their field. However, STEM scientists are most vocal about Climate Action, while Social Scientists are more active on Income Redistribution. Notably, gaps between disciplines have narrowed over time, contrasting with common stereotypes of scientist politicization (Altenmüller et al., 2024).

[17]Names were classified as "Male" or "Female" with 99% accuracy (see Appendix Section 4).

2.2.3. *Scientists' Ideological Polarization on Twitter*

Our analysis thus far shows that, of the 97,737 academics sampled, 52,541 engaged in tweeting about political issues, with 81% of these expressing non-neutral stances on at least one of the five salient topics. We define *ideological polarization* as the divergence in political views or issue positions among individuals.

For each topic and user in a given month, we calculated their slant as the difference between the number of pro-stance tweets and anti-stance tweets, divided by the total number of tweets (pro, anti, or neutral) they posted during that month on that topic.[18] This is expressed as:

$$S_{um} = \frac{pro_{um} - anti_{um}}{pro_{um} + anti_{um} + neutral_{um}}$$

In this formula, S_{um} denotes the net pro stance share of tweets by user *u* in time-period *m*, relative to all their tweets on a topic. This approach provides, for each individual, a continuous measure of slant ranging from -1 (completely anti) to 1 (completely pro) for each topic, at any point in time. Our method captures the spectrum of opinions, from strong opposition to firm support, while distinguishing between more moderate or explicit positions—an essential feature in environments where public opinions may lean toward socially desirable expressions (Bénabou and Tirole, 2006).

Figure 4 displays the net pro stance distributions S_{um} for each topic across academics and general users over the entire sampled period. Except for Racial Equality, neutral views dominate; however, multiple peaks—confirmed by Hartigan's Dip Test (Hartigan and Hartigan, 1985) (p=0)—indicate strong multimodality and distinct political camps. General users cluster more at extreme conservative stances (e.g., -1) than academics, who concentrate in the moderate liberal/progressive range. Notably, for Racial Equality, with few neutral stances, users show higher consensus by clustering more at the fully pro stance compared to academics. Appendix Figure 3 further compares early (2016–2017) and late (2021–2022) net pro stance distributions. Results suggest shifts in opinions over time, particularly on topics like Immigration and Abortion Rights, for which KS is highest

[18] Specifically, we measured individual academics' slant following the theoretical framework of Esteban and Ray (1994), categorizing tweets into 'pro', 'anti', and a residual 'neutral' category.

(Massey Jr, 1951), highlighting the dynamic nature of ideological polarization among academics.

We also examine differences in net stances between tweets mentioning scientific research or not and how differences in Twitter reach and post type influence academics' net stances. Appendix Figure 4 shows that academic research-related tweets are significantly more moderate than non-research tweets (except for Climate Action, where differences are smaller and research tweets are slightly more progressive). The largest divergence between research and non-research-related tweets is seen in Abortion Rights: non-research tweets skew more pro-choice (+1) while research tweets cluster more near neutrality (0). Further, Appendix Figure 5 indicates that academics with lower Twitter reach (below the median of 522 followers) exhibit more extreme stances, whereas high-reach academics appear more moderate. Finally, Appendix Figure 6 reveals that retweets display consistently more extreme stances than original tweets—particularly for Abortion Rights and Climate Action—suggesting that original posts tend to be more measured while retweets amplify polarized views.

Findings align with expectations: research-related tweets likely reflect professional norms of moderation, while non-research tweets allow for more direct political expression. Similarly, academics adopt a more measured tone in their original posts, potentially exercising greater caution with content directly attributable to them. Overall, these patterns highlight the sensitivity of our measure in capturing differences between more neutral or explicit positions.

2.2.4. *Evolution of Scientists' Disagreement*

We finally examine the evolution of disagreement among scientists by computing the monthly variance of net pro stances S_{um} for each topic. Variance provides a continuous measure of opinion diversity that is insensitive to the average stance yet highly sensitive to extremes, facilitating longitudinal and cross-topic comparisons (McCarty et al., 2016). Although variance is robust and interpretable for large datasets, it does not reveal the causes of disagreement (Fiorina et al., 2005) and may overstate divergence if few hold extreme views; it also may not capture consensus well (Hopkins, 2018). Therefore, we interpret variance in relative terms—lower variances indicate greater consensus—and examine its fluctuations over time and topics to identify both divergence and emerging agreement in the evolving ideological landscape.

The top left panel in Figure 5 ("All") aggregates all topics, showing a mild increase in disagreement from 2016 to 2022, which could raise concerns about scientific consensus and public trust. While scientists appear to exhibit greater ideological distance than general users overall, a topic breakdown reveals nuances. For most topics, the general U.S. Twitter population shows higher disagreement than academics. However, for Racial Equality, academics display a growing and more pronounced disagreement compared to the public—a disparity that disproportionately affects the aggregate trend given its high prominence. For Immigration, Income Redistribution, and Abortion, public disagreement is higher, with the gap widening during the pandemic before narrowing toward the end of the period. In the case of Climate Action, disagreement between academics and the general public persists throughout, with the gap widening further by the end of 2022.

3. SCIENTISTS' POLITICAL EXPRESSION AND PUBLIC PERCEPTIONS

Having examined the scope of online political discourse and issue-based disagreement among scientists—and compared these patterns to those of general X users—we now assess the risks of such engagement. Specifically, we study how scientists' political expression affects public perceptions of their credibility and contributes to audience polarization. We ran a conjoint experiment with 1,704 respondents from a broadly representative U.S. sample, recruited via Prolific—a platform widely used for experimental research (Bursztyn et al., 2023a, Enke et al., 2023).[19]

Our sample broadly reflects the U.S. population in terms of key dimensions, including political affiliation, region, ethnicity, and gender. As is typical with Prolific, respondents tend to be slightly younger, more educated, and have higher incomes than the general population. Importantly, prior work shows that Prolific's Republican sample is representative of the broader Republican population (Braghieri et al., 2024, Kashner and Stalinski, 2024). Appendix Table VI provides full demographic comparisons. To ensure data quality, all participants passed an attention check before beginning the main task.

[19] All studies and surveys in this paper were pre-registered on AsPredicted with numbers 166935, 179009, 181452, 186295, and 206927.

We opted for an online experiment over a field experiment on X due to several advantages, despite a minor conceptual mismatch with Section 2. First, the conjoint design on Prolific lets us systematically vary scientists' attributes—something hard to achieve on X. Second, a field experiment would require creating fake scientist profiles to engage with users, a method both impractical and likely to raise authenticity concerns. Third, typical field outcomes like follow-backs and retweets (Ajzenman et al., 2023a,b) are too narrow for capturing perceived credibility.

3.1. *Experimental Design*

Following best practices for conjoint experiments (Hainmueller et al., 2015), we created five hypothetical scientist profiles, randomly varying key attributes: gender (male/female), research field (Social Sciences, STEM, Medicine, Humanities), seniority (junior/senior), university prestige (high/low), and political affiliation.

The latter—our main attribute—is conveyed through a Twitter-style bio and a high-engagement tweet,[20] spanning five categories: Strong Democrat, Moderate Democrat, Neutral (baseline), Moderate Republican, and Strong Republican.

The five political profiles were created by randomizing the remaining attributes, ensuring each had a unique combination of characteristics. Vignettes followed a consistent format and were shown in random order to avoid order effects (see Appendix Table VII and Figure 7 for a visual representation).

> *The profile you are seeing is a [**Gender**] scientist.*
> *This scientist works in the field of [**Research Field**]*
> *Currently, this scientist is a [**Seniority**] at the [**University Affiliation**].*
> *The scientist is active on X (formerly known as Twitter).*
> *The Twitter bio of the scientist is: "[**Twitter Bio**]".*
> *A recent selected Tweet reads: "[**Twitter Post**]".*

Participants rated the credibility of the scientist and their research separately on a 0–10 scale, and indicated their willingness to read an opinion piece by a similar scien-

[20] High-engagement tweets (those with many likes, retweets, and comments) are used for their greater visibility.

tist (0–10).[21] To encourage truthful responses, participants were told they would receive an article from a real scientist matching their ratings.[22] The design included 960 unique profiles, generated from all combinations of 2 (gender) × 4 (field) × 2 (seniority) × 2 (university affiliation) × 5 (political profile).

Our within-subject conjoint design covers the full political spectrum and provides greater power to detect the effect of each attribute. A between-subject design, by contrast, would allow only limited variation—for example, varying the Twitter bio while holding the tweet constant. However, to complement our main task, we also ran a between-subject task in which respondents rated the credibility of an economist (discipline held constant). In this additional task—detailed in Section 3.4—the tweet (promoting a research paper) was fixed, while political leaning was signaled only through the bio (left or right). This design allowed us to isolate whether credibility penalties stem from politically salient research topics or from identity cues unrelated to scientific content.

Our design addresses common concerns in conjoint experiments (Hainmueller et al., 2015), particularly attribute-order effects and experimenter demand effects. To mitigate order effects, we placed the primary attribute—political affiliation—at the bottom of the profile. To reduce demand effects, we highlighted multiple salient attributes and informed respondents that they would receive an opinion piece from a real scientist matching their top-rated profile. We explicitly discuss and bound potential demand effects in Section 3.2.2. To enhance profile plausibility, we informed participants that all tweets were from real scientists and stated in the consent form that no false information was used. Full experimental instructions are provided in the supplementary Instructions material.

3.1.1. *Validating Twitter Political Signals*

To validate our political affiliation signals, we surveyed 98 new Prolific participants who categorized each combination of Twitter bios and tweets from the main experiment into one of five labels: Strong Republican, Moderate Republican, Neutral, Moderate Democrat,

[21] Hainmueller et al. (2015) shows that single- and paired-vignette designs yield similar estimates; we use the simpler single-vignette approach.

[22] Prior work finds no significant difference between hypothetical and incentivized responses (Hainmueller et al., 2015, Brañas-Garza et al., 2021, 2023, Enke et al., 2022).

or Strong Democrat. Appendix Figure 8 shows that most responses matched the intended labels, with misclassifications largely limited to adjacent categories. This high accuracy confirms that our signals were reliably perceived, supporting the credibility of our design.

3.2. *Impact on Public Perceptions*

Figure 6 shows that scientists' online political expression leads to a monotonic penalty: neutral profiles receive the highest ratings for personal credibility, research credibility, and willingness to read opinion pieces, with outcomes declining significantly as political affiliations become more extreme on either the left or right.

Scientists expressing any political stance are viewed as less credible than neutral ones (Panel A), supporting the stereotype that scientists should remain impartial (Altenmüller et al., 2024). Relative to neutral scientists, Strong Republicans are rated 39% less credible and Strong Democrats 11% less. Moderate Republicans and Moderate Democrats incur smaller penalties—9% and 7%, respectively. An identical pattern holds for research credibility, indicating that political discourse impacts both personal and scientific credibility.

Similarly, willingness to read declines monotonically: respondents are 42% less willing to read from Strong Republicans and 10.7% less willing to read from Strong Democrats. Moderate Republicans and Moderate Democrats see more limited declines of 8% and 4.5%, respectively. All results remain robust when controlling for respondent characteristics (Appendix Figure 9, Panels C and D).

While political affiliation is the most salient attribute, a few additional characteristics also marginally affect public perceptions. Scientists from prestigious institutions (e.g., Harvard, UC Berkeley, UChicago) are rated as more credible and attract higher readership than those from less prestigious ones (e.g., University of Arkansas, University of Connecticut), as shown in Appendix Figure 9 and Appendix Tables VIII to X. When examining each political profile separately, the benefit of a prestigious institutional affiliation holds for all except the neutral academic, and it even results in a penalty for Strong Democrat profiles. Moreover, Full Professors are generally seen as more credible and are more likely to be read than Assistant Professors.

Other attributes are never statistically significant. Specifically, gender does not appear to affect credibility—though neutral male scientists are (non-significantly but consistently) less likely to be read than their female counterparts, partly consistent with findings in Sievertsen and Smith (2025).

3.2.1. *Heterogeneity by Respondent Leaning*

To determine whether scientists' online political expression may contribute to polarizing audience views, we analyzed how perceptions of different scientist profiles vary based on respondents' political leanings. Panel B of Figure 6 reveals significant heterogeneity tied to political identity, showing a clear pattern of affective polarization.

Respondents identifying as *Democrat* or *leaning Democrat* assign substantially lower credibility to the Republican-leaning scientists: the Moderate Republican scientist faces an 18.3% credibility penalty and the Strong Republican a 60% penalty (Panel B, dark blue), with willingness-to-read dropping by 23.2% and 69%, respectively (light blue). These respondents view the Neutral and Democrat-leaning scientists similarly.

Conversely, respondents identifying as *Republican* or *leaning Republican* rate the Democrat-leaning scientists as 16% (Moderate) to 26% (Strong) less credible (Panel B, dark red), and are 18%–30% less willing to read their opinions (light red). Notably, they view the Moderate Republican scientist as 3.1% more credible than the Neutral one and are 11.6% more willing to read them. While the Strong Republican scientist is rated 12% lower in credibility than the Neutral one, they remain more credible than the Democrat-leaning scientists, with only a 7% drop in willingness-to-read.

Overall, the gap in willingness to engage with scientists holding opposing political identities ranges from 18%–23% for moderate stances and increases to 30%–69% for extreme ones. These results, consistent with Ajzenman et al. (2023b) and Rathje et al. (2021), show a monotonic pattern: stronger political signals lead to larger penalties among politically opposed respondents, reflecting affective polarization. Crucially, the drop in personal credibility extends to perceived research credibility and translates into lower willingness to engage with their content. Barrios et al. (2024) documents a comparable effect—a 30% decline in trust in an economics paper due to a conflict of interest—aligning closely with our findings.

3.2.2. *Robustness Checks*

We conducted several robustness checks to address potential concerns: (1) sample and procedure robustness, (2) variation in perceived expertise, (3) differential respondent attention, (4) misperception of political profiles, (5) multiple hypothesis testing, and (6) experimenter demand effects.

Replication We replicated the main experiment with 2,000 new Prolific respondents, eliciting only two outcomes—credibility and willingness to read. Results are virtually identical, confirming robustness to procedural changes and to a new, representative U.S. sample (available upon request).

Role of Expertise As discipline is randomized across profiles, we test whether matching a scientist's expertise to the topic of their post affects perceptions (e.g., the Strong Republican may be a medical expert; the Moderate Democrat a STEM expert). Appendix Tables VIII–X show no significant effect of such alignment on credibility or willingness to engage.

Carryover Effects A crucial assumption for our design is the absence of carryover effects across profiles. Such effects would imply that a respondent's evaluation of one profile is influenced by those seen before or after, introducing bias. Although unlikely due to randomization, we explicitly test this by analyzing responses within each round. Appendix Figure 12 confirms that results are consistent across rounds, ruling out order effects.

Excluding 'Speeders' A common concern in online experiments is that some respondents rush through tasks without paying adequate attention, introducing noise. We therefore exclude respondents who completed the survey in under one minute (median time: 7.2 minutes). Appendix Figure 13 shows results remain stable, indicating inattentive respondents are not driving our findings.

Permutation Test We further test whether the baseline 'neutral' scientist inadvertently signals political identity. We randomly reassigned labels across the five profiles seen by each respondent and re-estimated our main result, repeating the procedure 100 times. Appendix Figure 14 shows the resulting coefficients cluster around zero, supporting the neutrality of the baseline.

Multiple Hypothesis Testing One advantage of a conjoint experiment is the ability to simultaneously test multiple attributes, though this requires correction for multiple hypothesis testing. We adjust for multiple comparisons using the false discovery rate method (Benjamini et al., 2006), correcting for 11 treatments (16 attribute categories minus five baselines). Appendix Table XI shows that estimates remain statistically significant after correction.

Experimenter Demand Our design minimizes demand effects by placing political affiliation last among randomized attributes and incentivizing truthful responses via a tailored newsletter. Yet, we bound potential residual effects by conducting a separate experiment with 354 U.S. respondents. After rating a neutral profile, subjects were shown either a Strong Republican or Strong Democrat profile. Before rating the second, they were nudged to rate it either higher or lower to induce demand (de Quidt et al., 2018). Appendix Figure 10 shows that these nudges had little effect: neutral scientists remain the most credible and readable, while left- and right-leaning profiles incur penalties.

3.3. *Impact on Journalists Perceptions*

To assess external validity, we conducted a simplified experiment with 135 international journalists recruited via Prolific. The sample includes experienced professionals employed in various roles and outlets (50% with over 5 years of experience, 78% as reporters or editors, and over half based in the U.S. or the UK), with roughly 60% affiliated with politically oriented outlets (see detailed summary statistics in Appendix Table XII).

In this streamlined experiment, journalists viewed three scientist profiles—signaling Strong Republican, Strong Democrat, and Neutral ideologies via Twitter biographies (without tweets).[23] They evaluated the credibility of the scientists and their research and indicated their willingness to feature an opinion piece from a scientist with such characteristics. To incentivize thoughtful responses, journalists were informed that an opinion piece from their highest-rated scientist would appear in a newsletter shown to 100 readers, with a monetary bonus awarded if their selected piece ranked among the top five preferred by readers.

[23]We reduced the number of profiles to account for the limited sample size while maintaining statistical power.

Appendix Figure 11 replicates our main findings in this new sample of international journalists: neutral scientists are rated highest, while ideologically non-neutral profiles incur significant penalties. Specifically, journalists perceive the Strong Republican scientist and their research as 33% and 32% less credible, respectively, and are 40% less willing to feature their opinion piece, relative to a neutral scientist (Panel A). By contrast, the Strong Democrat scientist is rated 5% less credible (4% for their research) and elicits a 2% lower willingness to feature their opinion piece; however, these smaller effects are not statistically significant. The more pronounced effects for Republican profiles are mainly driven by the liberal majority among journalists (62%): among liberal respondents, penalties for Republican scientists range from 42% to 56% (Panel B), while conservative journalists impose penalties of 18% to 28% on Democrat scientists.

We further explored factors shaping journalists' preferences by surveying their views on disclosing scientists' political leanings (when known), expectations of reader reactions to featuring politically engaged scientists, and willingness to engage with such scientists who are politically active on social media. Appendix Table XIII shows that over half of the journalists believe a scientist's political leaning should be disclosed and that featuring politically active scientists can affect a newspaper's credibility. While they anticipate mixed reader reactions, most remain inclined to reach out to politically active scientists—suggesting that journalists may play a role in amplifying scientists' political opinions and shaping public perceptions of scientific credibility.

3.4. *Disentangling Mechanisms*

Scientists may share political views while discussing their research on politically charged issues or when expressing opinions unrelated to their work. We aim to disentangle whether these two types of communication have different effects on public perception. Specifically, we test whether perceived credibility is influenced by (1) tweeting about research on politically salient topics, which may signal ideological bias (Altenmüller et al., 2024), or (2) signaling political identity through content unrelated to research (Ajzenman et al., 2023b, Rathje et al., 2021, Levy, 2021). While other mechanisms may matter, our design isolates these two core, policy-relevant channels.

Experimental Design To disentangle the two channels, we added a final task immediately after the main experiment in Section 3.1. Respondents were randomly assigned to one of four conditions that varied whether an economist (who regularly discusses politically salient issues) tweets about recent research on a politically sensitive topic (vs. a non-sensitive one), and whether their Twitter bio includes a clear political signal (vs. a neutral one). Expertise is held constant across all profiles.

In the *passive control*, the economist discusses game theory research on a non-political issue. In the *active control*, the economist tweets about research on the negative impact of policies on migrants' health—a topic with a potentially left-leaning narrative.[24] The difference between active and passive control isolates the effect of politically sensitive research content on perceived ideological bias. Both profiles feature neutral Twitter bios. Two treatment arms add a political signal in the Twitter bio—either *Left* ("advocate for equality") or *Right* ("proud patriot")—while keeping the same politically salient research as in the active control (see Appendix Figure 15). This isolates the effect of explicit political identity.

After viewing one of the four profiles, respondents rated the economist's personal and research credibility and their willingness to read an opinion piece from a similar economist. They were also invited to subscribe to a free newsletter on U.S. socio-economic issues featuring similar economists, delivered via Prolific message (see screenshot in Instructions Material). Finally, we measured respondents' general trust in scientists using three Likert items, averaged into a composite index.

Results Figure 7 shows that both channels—research content and political identity cues—influence audience perceptions, with effects varying by respondents' political leanings. Among Democrats, perceptions remain stable when the economist discusses non-political research content. However, politically aligned research increases perceived credibility by 8.6% (economist) and 6.3% (research), and raises willingness to read by 33%. Adding a left-leaning bio further increases credibility by 1.7% and willingness to read by 7.1%. A right-leaning bio, by contrast, reduces credibility by 8.6%—bringing it back to the non-political baseline—and lowers willingness to read by 4.5%. Republican respondents

[24] The research topic was chosen to clearly align with one political side and oppose the other, facilitating interpretation. Symmetrical effects are expected with right-leaning aligned research.

show the opposite pattern: when the economist discusses politically misaligned research, credibility drops by 12% relative to the non-salient benchmark. This penalty increases by 5% with a left-leaning signal and is reduced by 5% with a right-leaning one. Willingness to read follows a similar trajectory.

Newsletter sign-ups and overall trust in science show similar, though less pronounced, patterns. Correlating newsletter demand and willingness to read validates the latter outcome ($\beta = 0.064$, p < 0.001). Recontacting respondents a few weeks later further confirms engagement: of 595 participants who expressed interest in the newsletter, 440 were successfully recontacted, and 86% clicked the newsletter link to join.

The bottom of Figure 7 presents average outcomes for treated respondents relative to either the active or passive control, allowing a clearer comparison between in-group and out-group conditions. In-group respondents—those whose political leanings match the political signal—rate scientists more favorably across all outcomes. Regression results in Appendix Tables XIV and XV confirm these findings.

These results highlight two main insights. First, audience responses vary sharply by political alignment: for the same content, credibility and engagement increase when the political signal aligns with the respondent's views—clear evidence of affective polarization. Second, both channels independently shape perceptions of scientists' credibility.

4. SCIENTISTS' VIEWS ON ONLINE POLITICAL EXPRESSION

Having quantified academics' political expression and its reputational risks, we now examine scientists' self-reported views using two surveys. We recruited 128 scientists globally via Prolific.[25] Appendix Table XVI describes the sample: 94% are employed (over 60% at universities), including 43% postdoctoral researchers, 28% faculty, and 29% industry professionals; 34% work in life sciences/biomedicine, 34% in social sciences, and the remainder in physical sciences or technology.

The first survey covered three areas. First, we asked whether scientists expect a credibility penalty for expressing political opinions on social media. Second, we elicited first- and second-order beliefs about the acceptability of political expression within and beyond

[25] Prolific respondents were screened for employment in "Research," PhD-level education, and English fluency.

their expertise, following Bursztyn and Yang (2022).[26] Third, we asked about personal experiences with publicly expressing political opinions.

To gauge the expected credibility penalty, we told respondents that scientists who **do not** express political opinions receive a trust score of 7.2/10, then asked: "*What is the reported trust level for scientists who **do** express political opinions on social media?*"[27] As shown in Figure 8, respondents expect a 30% trust loss—nearly double the experimentally observed loss of 16.6%, consistent with cheap-talk models under reputational concerns (Morris, 2001, Ottaviani and Sørensen, 2006).

Relative to professional norms, Panel A of Appendix Figure 16 shows that scientists consider political expression acceptable when related to their expertise, but not beyond it.[28] Panel B shows they believe peers share this norm. Finally, Panel A of Appendix Figure 17 indicates that scientists are significantly more hesitant to comment on topics outside their field,[29] while Panel B shows they expect negative repercussions for out-of-field comments and net benefits for in-field ones, though the differences are small.

To further examine the perceived professional costs and benefits of expressing political views online, we again surveyed 118 international scientists via Prolific. This survey disentangles the perceived impact of political expression on outcomes such as network size, citations, academic job offers, media appearances, policy roles, and top publications.

Figure 9 compares three profiles: Scientist X (grey), who expresses political views related to their research; Scientist Z (red), who expresses views on unrelated topics; and Scientist Y, identical to X or Z but refraining from political expression. Distributions shifted toward X or Z (green areas) indicate perceived benefits, while a denser left tail for Y (blue areas) signals perceived costs. The results reveal clear perceived benefits for media appearances and policy roles, milder benefits for network size and citations, and ambiguous or slight costs for top publications and job offers.

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[26] That is, both scientists' own views and their perceptions of peers' views.

[27] Participants earned a £0.50 bonus for a correct response.

[28] This aligns with Garg and Fetzer (2024), who find that academics adopt more pro-social views on topics where they hold expertise.

[29] This complements evidence of a 'spiral of silence' in academia (e.g., Norris (2020)).

Finally, we posed three open-ended questions to capture scientists' views on what constitutes "politicized" behavior, the boundaries of expertise for political commentary, and personal experiences with its costs and benefits. Appendix Table XVII summarizes these responses, highlighting recurring concerns about credibility, expertise boundaries, and the trade-offs of political engagement. While our Twitter data cannot fully capture scientists' motivations, survey responses consistently suggest that academics perceive greater benefits when political opinions align with their research expertise.

5. CONCLUSION

This study demonstrates that scientists' public expression of political views on social media significantly shapes public perceptions of their credibility.

First, we show that political discourse is common among U.S. academics: between 2016 and 2022, roughly 44% of 97,737 scientists actively discussed political issues on Twitter—over six times the rate observed among a random sample of U.S. Twitter users. Topics like climate change and racial equality are frequently discussed, often with divergent viewpoints.

Second, using conjoint experiments with 4,000 U.S. representative respondents and 135 international journalists rating synthetic academic profiles with varied political affiliations, we identify a monotonic credibility penalty for scientists who express political views. The more extreme the position—on either left or right—the less credible the scientist and their research are perceived, and the lower the willingness to engage with their content, especially among ideologically opposed respondents.

Complementary surveys of 128 international scientists reveal that they expect an even larger credibility penalty than what we observe experimentally. Scientists broadly view political expression as acceptable when related to their expertise, but not beyond it—reflecting a prevailing norm within academia. At the same time, they recognize potential professional benefits from political engagement, particularly when aligned with their research.

Studying the reputational costs of scientists' online political engagement reveals a fundamental trade-off. Expressing political views can undermine scientists' credibility, limiting their ability to shape public preferences and influence decision-making while potentially deepening affective polarization. At the same time, anticipating this credibility penalty may discourage scientists from participating in policy debates—leading to information loss and diminishing the societal value of expert engagement. These effects are further mediated by scientists' perceptions of personal career benefits from engaging on social media.

Our results highlight a significant challenge to the Mertonian norm of Universalism (Merton, 1973), which holds that scientific work should be judged on its merits, not on the scientist's identity or beliefs. While a full welfare analysis is beyond our scope, the findings highlight an important trade-off with clear policy implications. It may be disheartening yet unavoidable that political opponents react negatively to research tweets on politically charged topics—as seen in the Active Control from Section 3.4—but such tweets still serve to transmit knowledge. By contrast, scientists' use of uninformative cues, such as partisan emojis in bios, may unnecessarily narrow their audience, intensify affective polarization, and hinder the flow of information in public debate.

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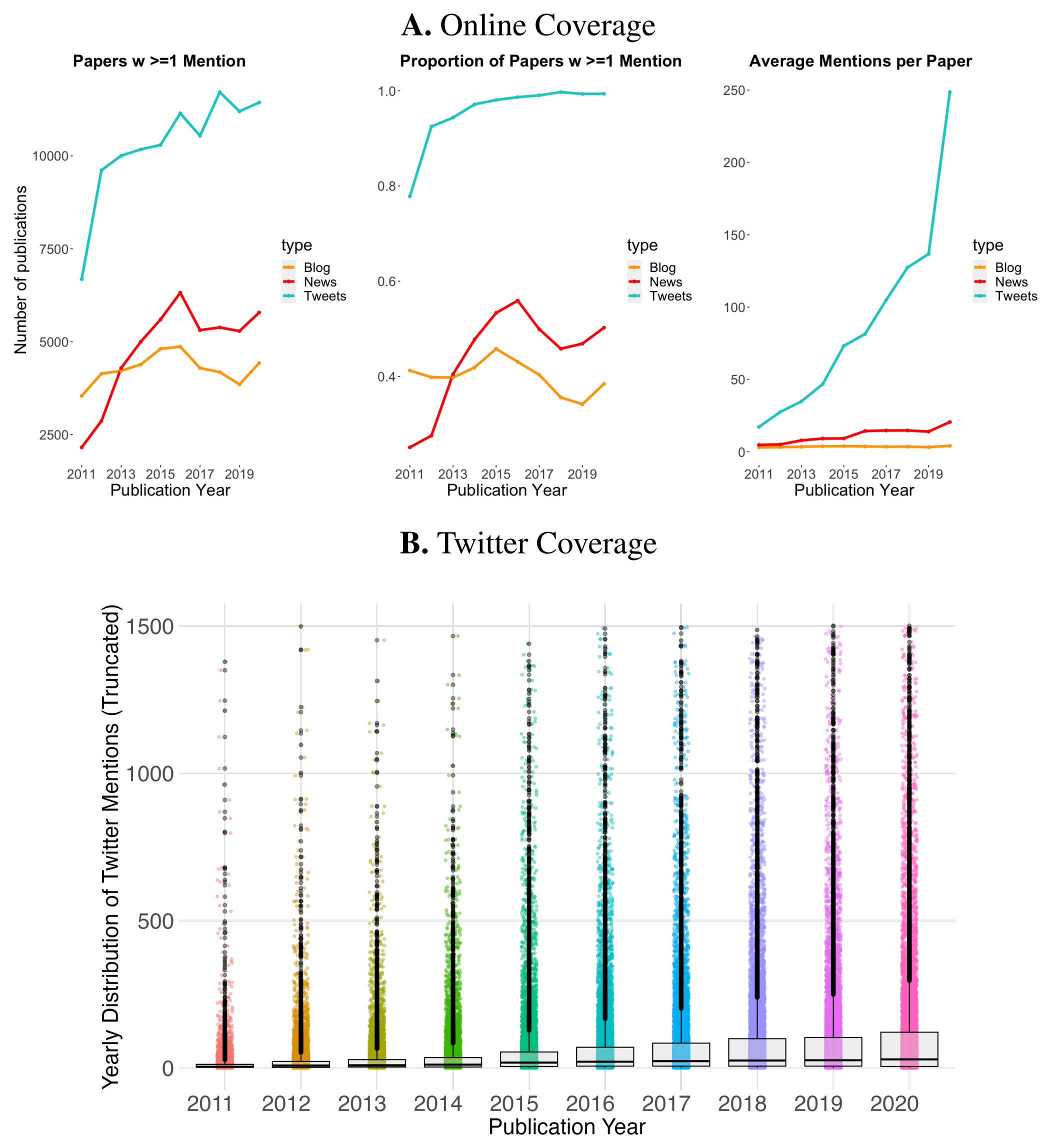
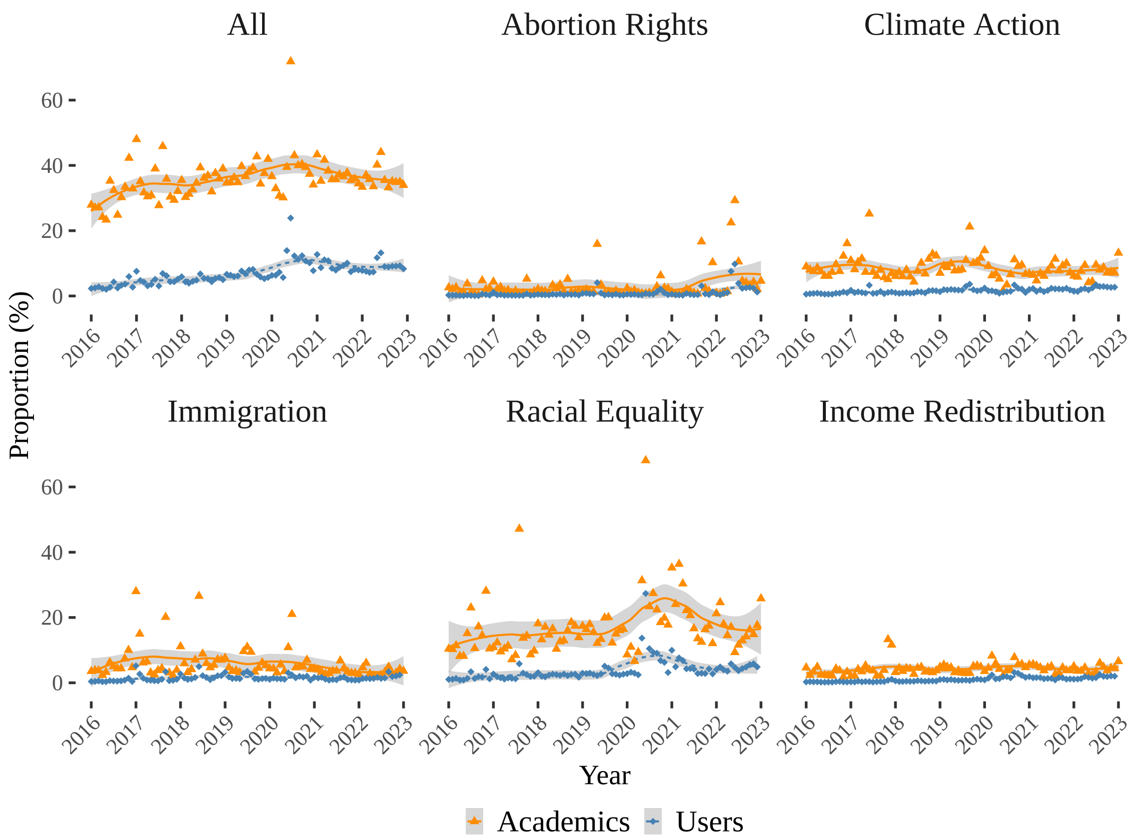
FIGURE 1.—Online presence of research articles published in general interest journals between 2011 and 2020



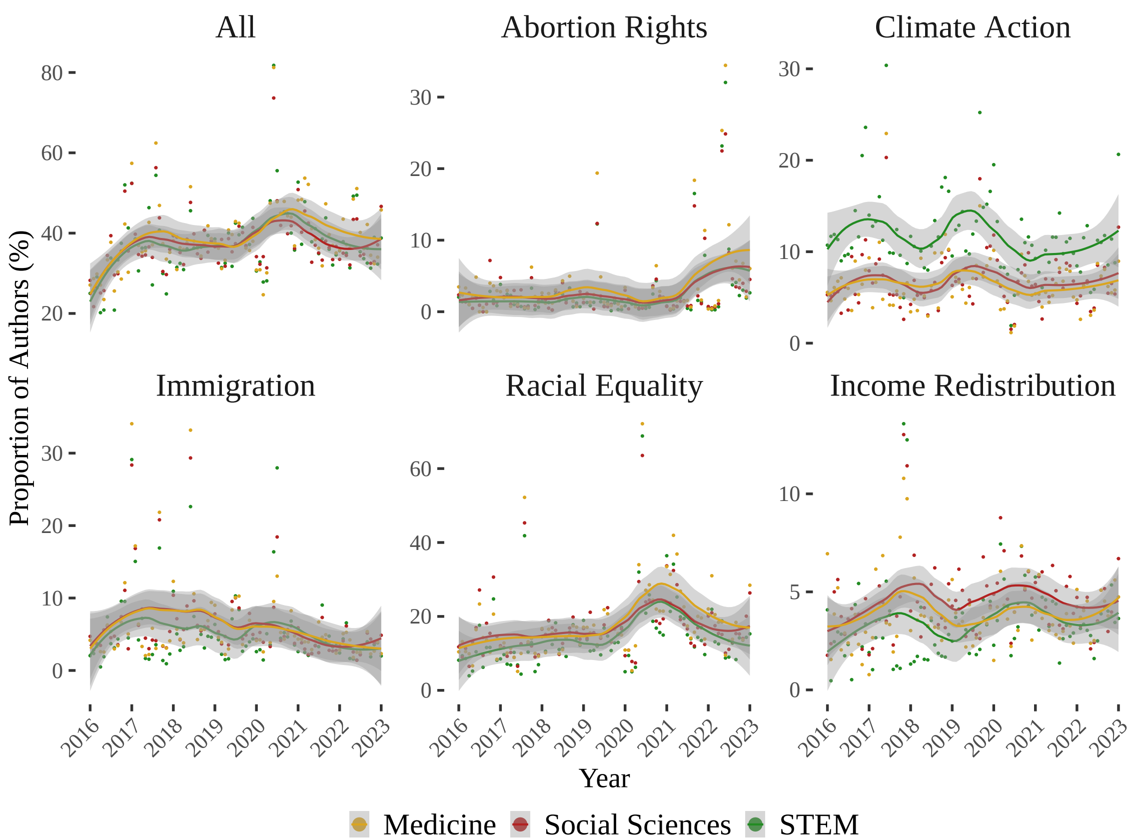
Note: Figure A provides trends in online coverage of scientific articles published in *Science*, *Nature*, *PNAS*, *Cell*, *NEJM*, and *Lancet* between 2011 and 2020. Online appearances across blog posts, newspaper articles, or Twitter are retrieved from Altmetric (accessed on November 10th, 2021). The figure suggests that scientific articles with any online appearances have increased over time, in absolute number (first row), as a proportion of all articles published (second row), and per average number of appearances per published paper (third row). Figure B provides trends in Twitter coverage of scientific articles published in *Science*, *Nature*, *PNAS*, *Cell*, *NEJM*, and *Lancet* between 2011 and 2020. The data present the distribution of Twitter mentions per article, retrieved from Altmetric (accessed on November 10th, 2021). The figure indicates growing online presence, with the distribution of Twitter mentions becoming less skewed towards zero, with a ticker right tale and a rise in high-mention outliers over time.

FIGURE 2.—Proportion of US Users and Academics with a Political Opinion Over Time



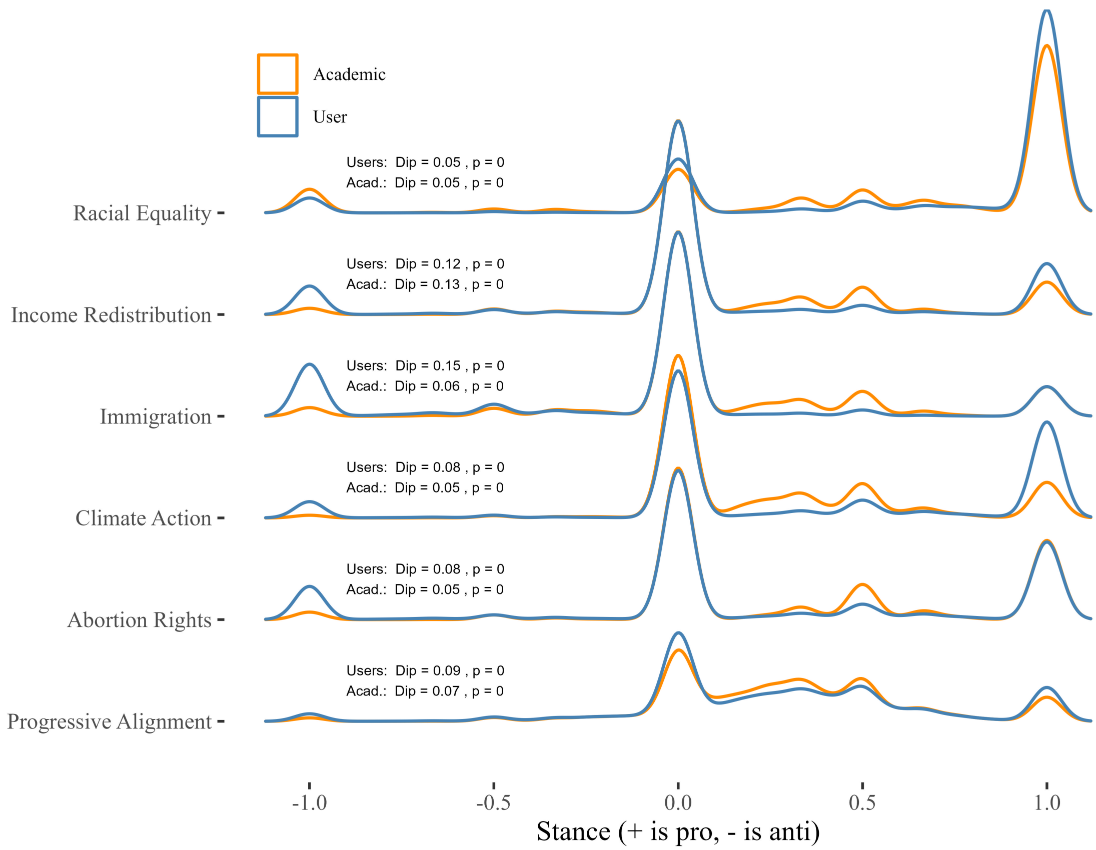
Note: The figure illustrates trends in politicization of conversations by academics and general users on Twitter from 2016 to 2022. Monthly aggregated scatter plots display expressed stance for each topic, with a LOESS applied for trend visualization. Standard errors are depicted in the shaded region. In the "All" panel, around 40% of tracked US academics expressed opinions on predefined political issues, compared to 5-10% of general users. Variations and spikes are observed across topics, with Climate Action and Racial Equality showing the largest disparities. Climate Action witnessed significant declines during the COVID-19 pandemic onset. Mid-2020 saw a surge in attention to Racial Equality, reflecting the outcry after the George Floyd incident. Other topics exhibit stable increasing trends, with occasional short-lived spikes, notably in Abortion Rights around changes in laws in 2022. Immigration discussions, while less frequent, maintained regularity, with heightened attention during the 2016 presidential election.

FIGURE 3.—Proportion of Academics with Political Opinions Over Time by Topic and Discipline



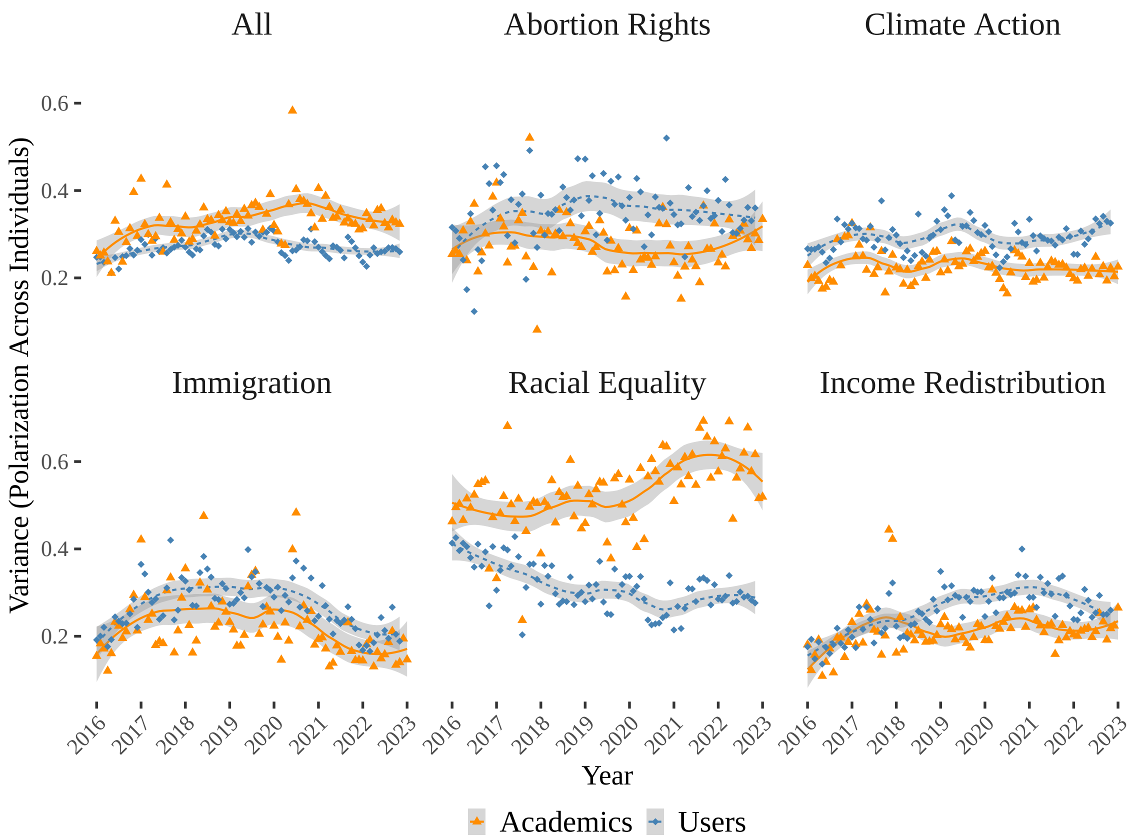
Note: OpenAlex describes "Concepts" as abstract ideas that a work is about: "Concepts are hierarchical, like a tree. There are 19 root-level concepts, and six layers of descendants branching out from them, containing about 65 thousand concepts all told". OpenAlex classifies each work with a high level of accuracy. We combine the 19 root-level concepts into 3 broad categories for ease of comparison: (1) Medicine, (2) Social Sciences, and (3) STEM. We omit Humanities from the time-series depiction given we have only around 100 humanities' academics, which would create unreliable trends. Each work by an author can belong to multiple concepts and a score from 0 to 1 is given to each concept, where values closer to 1 reflect the likelihood the work belongs to that concept. For each academic, we take the average score for all the root-level concepts across all their works from 2016-2022. We then pick the primary concept of that academic as the root level concept with the highest average score. This depicts the proportion of academics within each concept category expressing an opinion about a political topic. Our analysis reveals distinct patterns and spikes across concept categories for two issues: Climate Action and Income Redistribution. STEM academics consistently show significantly higher engagement with Climate Action, almost doubling the frequency of expressions from other fields in any given period. On Income Redistribution, however, STEM academics were notably less vocal than those in Medicine or Social Sciences before 2020, after which the differences narrowed.

FIGURE 4.—Cross-sectional Ideological Polarization across US Users and Academics, 2016-2022



Note: The figure illustrates the density distribution of net stance across various political topics among U.S. academics (in orange) and general users (in blue) from 2016 to 2022. Topics include Income Redistribution, Climate Action, Immigration, Abortion Rights, and Racial Equality, with "Progressive Alignment" representing the average stance across these topics. The x-axis represents the net stance, where positive values indicate a pro-stance and negative values indicate an anti-stance. The y-axis indicates different topics, with density distributions shown as ridgelines. Each ridgeline highlights where individuals tend to cluster in their expressed opinions. Black vertical lines within each distribution represent the mean net stance for each topic. Hartigan's Dip Test identifies multimodal distributions, suggesting distinct ideological camps. The dip statistic and corresponding p-value are annotated for each topic, demonstrating statistically significant multimodalities for both groups. Compared to academics, general users tend to cluster more around extreme viewpoints, especially towards the conservative (-1) side on most issues. Academics, on the other hand, have a larger mass in the moderate liberal/progressive range. An exception to this is the issue of race, where general users show more consensus, with a larger mass towards pro-racial equality. Both groups exhibit statistically significant multimodal distributions (p-values of 0), with users showing slightly higher dip statistics on average, indicating more pronounced ideological polarization.

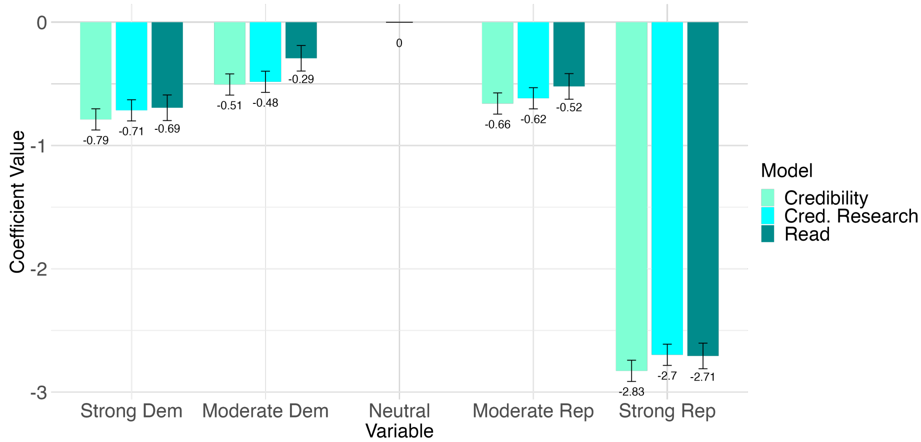
FIGURE 5.—Issue Disagreement Across Academics By Topics Over Time



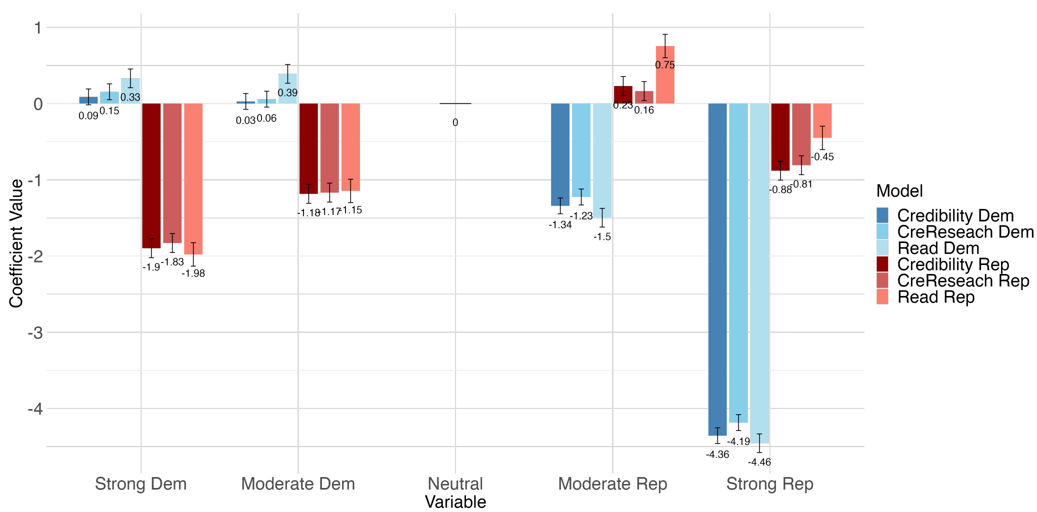
Note: The figure measures ideological polarization by computing the variance of net stance held by a population on predefined political topics. Variance across users reflects the dispersion of political opinion on each topic, providing a continuous measure of ideological disagreement. Aggregating across topics yields an overall measure of political variance. Similar to the increasing trend in expression of opinion, polarization increases between 2016 and 2022, raising concerns about its impact on scientific consensus-building and public trust in scientific expertise. Race exhibits wider debate among academics relative to the general population. Disparities in ideological disagreement are observed across topics, with gaps widening, particularly around the pandemic period for Immigration, Income Redistribution, and Abortion, but also closing by the end of 2022. The gap persists for Climate Action throughout the sample period and grows at the end of 2022.

FIGURE 6.—Impact of scientists' political expression on perceived credibility and willingness to read from the general public. Credibility and public willingness to read peak at neutral, with a monotonic penalty for scientists displaying political affiliations to the 'left' and 'right' of neutral.

A. Base Model

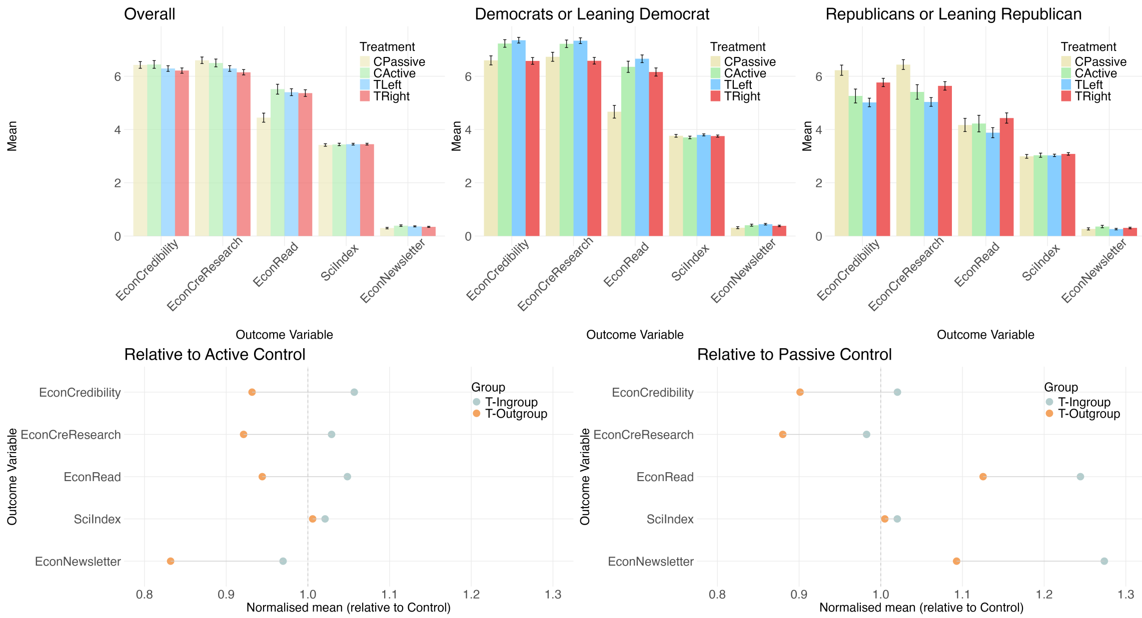


B. Heterogeneity by Respondents' Partisanship



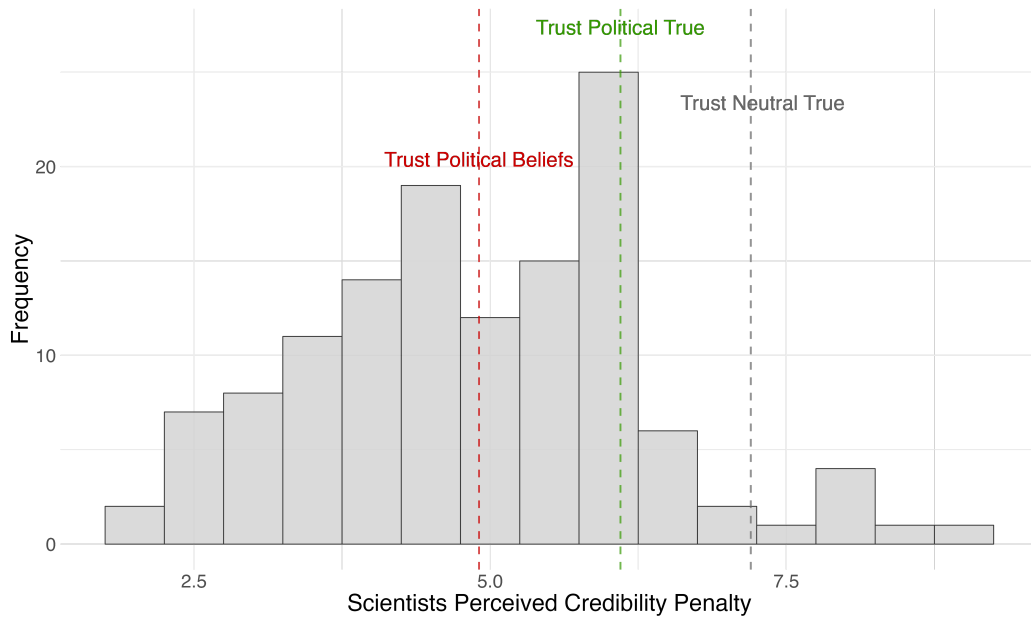
Note: Coefficients are obtained by regressing scientists' characteristics on respondents' perceived credibility or willingness to read content from scientists. The x-axis represents different political affiliations of scientists, estimated by indicator variables for "Strong Republican", "Moderate Republican", "Strong Democrat", or "Moderate Democrat", with "Neutral" as the excluded category. The y-axis shows the coefficient values indicating the impact on credibility and willingness to read. The data reveals a peak in credibility for neutral scientists, with a decline for both left- and right-leaning scientists. Standard errors are clustered at the individual level. Additional regressors include indicator variables to control for other scientist characteristics: institutional affiliation (Harvard, UC Berkeley, or Chicago, versus Arkansas or Connecticut), field of research (Medicine, Mathematics, Engineering, Economics, or Literature), seniority of role (Full professor or Assistant Professor), and gender (male or female). (N = 1704, 940 Dem. or Lean Dem., 745 Rep. or Lean Rep., 19 Other leaning.)

FIGURE 7.—Separating the effect of communicating salient research from pure scientists' political signal on respondents' perceived credibility. Any political signal reduces scientists perceived credibility. Effects are moderated by the congruence between participants leaning and scientists political signal.



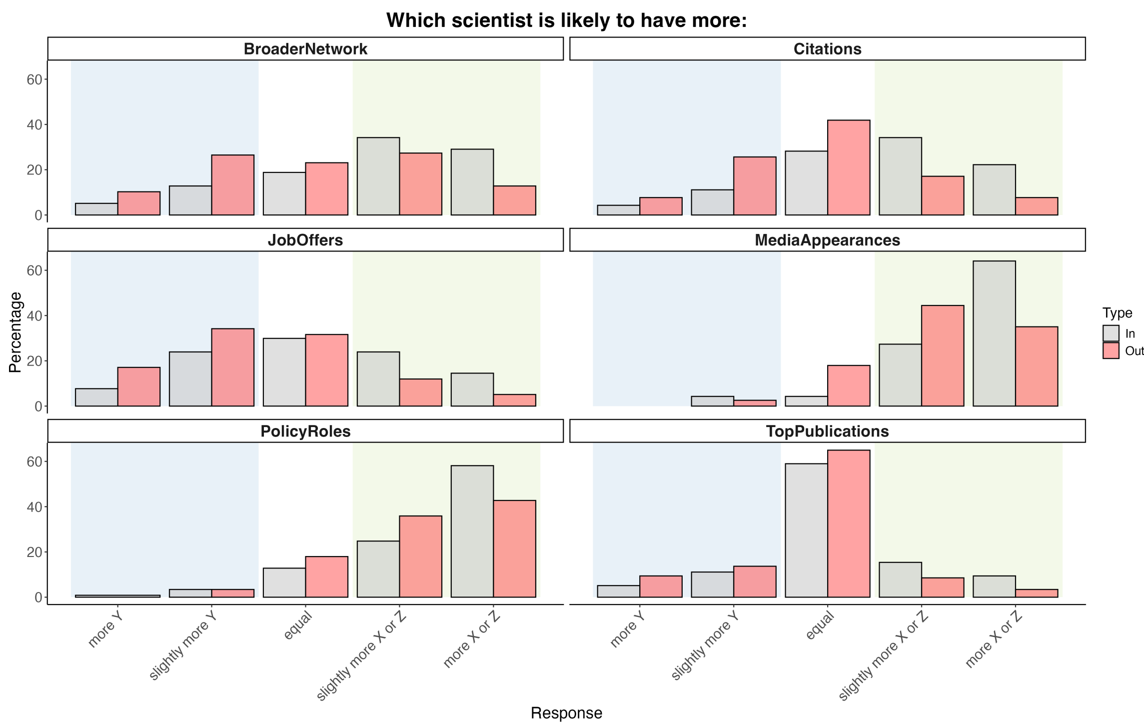
Note: Figures show results of our second experimental task where respondents are divided into four groups: in the *passive control* group, respondents are exposed to an economist who neither advertises own research in a politically salient issue nor signals any political affiliation; respondents in the *active control* group are exposed to the profile of an economist advertising own research in a politically salient issue with no political signal; respondents in the *treatment left (right)* group are exposed to an economist advertising their research in a politically salient issue together with a left (right) political signal. The politically salient research is favourable to a democrat leaning narrative. After viewing one of the four profiles, we collect the following outcome variables for each respondent: their perceived credibility of the economist, their perceived credibility of the economist's research, their willingness to read an opinion from the economist, their intention to sign up for a newsletter containing opinions from a similar profile, and a composite index of general trust in science. Democrats show higher credibility when exposed to politically aligned research. The left political signal increases perceived credibility, while the right signal reduces it. Similarly, willingness to read is higher with politically aligned research; the left signal increases it, while the right signal decreases it. Republicans exhibit significantly reduced perceived credibility when exposed to misaligned politically salient research, especially with a left signal, though less so with a right signal. Willingness to read is highest with a congruent right signal and lowest with a left signal. For both sub-samples, newsletter sign-up and overall trust in science move similarly, but changes are less pronounced. Additionally, normalising our group averages relative to the active or passive control, at the bottom, we observe that in-group respondents (when scientist signal and respondents leaning align) perceive significantly higher credibility of scientists and their research, are more willing to read their opinion, and are more likely to sign up to the newsletter, relative to out-group respondents. (N = 1704, 940 Dem. or Lean Dem., 745 Rep. or Lean Rep., 19 Other leaning.)

FIGURE 8.—Scientists' Beliefs about Credibility Penalty



Note: This figure reports the distribution of responses from 128 scientists recruited on Prolific to the following question: *"What do you think is the reported level of trust for scientists who do express political opinions on social media?"*. Prior to asking the question, we informed the academic respondents that we had surveyed a representative sample of the U.S. on their perceived credibility of scientists, distinguishing between those who had expressed political opinions online and those who had not. We anchored our scientists' beliefs on the public perceived credibility for scientists who *do not* express political opinions online (indicated by the grey dashed line). The average answer of our sample of scientists is shown by the red dashed line and is significantly lower than the true value obtained in the main survey of a representative sample of U.S. respondents, which is indicated by the green dashed line.

FIGURE 9.—Scientists' Perceived Costs and Benefits from Public Political Expression



Note: The figure illustrates scientists' perceptions of professional benefits based on public political expression. Respondents compared the outcomes for Scientist X (grey), who shares opinions on politically charged topics related to their research, and Scientist Z (red), who shares opinions on politically charged topics unrelated to their research, against Scientist Y, who refrains from such expression (respectively, either related or unrelated to their research). The evaluated benefits include network size, citations, academic job offers, media appearances, policy roles, and top publications. A distribution skewed towards X or Z (green area) reflects perceived benefits from political expression, while a denser left tail towards Y (blue area) indicates perceived costs. Results suggest clear benefits for media appearances and policy roles, milder benefits for network size and citations, and ambiguous or slight perceived costs for top publications and academic job offers.