Influential news and policy-making

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Abstract

This paper analyzes the implications of interventions that affect the costs of misreporting. I study a model of communication between an uninformed voter and a media outlet that knows the quality of two competing candidates. The alternatives available to the voter are endogenously championed by the two candidates. I show that higher costs may lead to more misreporting and persuasion, whereas low costs result in full revelation. The voter may be better off when less informed because of higher costs. When the media receives policy-independent gains, interventions that increase misreporting costs never directly harm the voter. However, lenient interventions that increase these costs by small amounts can be wasteful of public resources. Regulation produced by politicians leads to suboptimal interventions.

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1 Introduction

One of the most common criticisms leveled against the media is that they strategically distort news to pursue their private interests and affect political outcomes.[1] To counter the threat posed by the spread of disinformation, most countries enforce laws that punish the practice of misreporting information. Consider for example the United Kingdom's Representation of the People Act 1983 (Chapter 2, Part II, Section 106):

> A person who, or any director of any body [...] which—(a) before or during an election, (b) for the purpose of affecting the return of any candidate at the election, makes or publishes any false statement of fact in relation to the candidate's personal character or conduct shall be guilty of an illegal practice.

More recently, several governments have passed "fake news laws" to address the growing concern about distortions of the political process caused by disinformation. Most of these efforts revolve around the idea of affecting media outlets' costs of misreporting information through, e.g., fines, jail terms, and awareness campaigns (Funke and Famini 2018).[2]

This class of interventions is relevant not only because of its recent popularity, but also because it seeks to steer the conduct of media outlets without interfering with the markets' concentration levels. In "news markets" a single outlet with private possession of some information is in fact a monopolist over that particular piece of news. This is often the case with scoops, scandals, and "October surprises." Since breaking news spreads fast, even small outlets can reach a large audience when endowed with a scoop that can swing the outcome of an election.[3] In these circumstances, interventions that affect the costs of misreporting information might still discipline the behavior of those media outlets with exclusive possession of political news. Despite its relevance, the regulation of misreporting costs is currently understudied, and to date there is no formal model exploring its consequences.[4]

In this paper, I study the welfare effects of regulatory interventions that impose costs on media outlets for misreporting information. The key idea is that the implications of media bias are not confined to distortions of voters' choice at the ballot box, but spread and propagate back to the process of policy-making. Ahead of elections, competing candidates face a choice between gathering consensus with "popular" policies that benefit voters and seeking the endorsement of an influential media with "biased" policies that please media outlets. Since media bias skews electoral competition and

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[1] This concern is substantiated by empirical evidence that media bias has an impact on voting behavior (see, e.g., DellaVigna and Kaplan, 2007) and by the observation that mass media are voters' primary source of policy-relevant information (see Gottfried et al., 2016).

[2] Misreporting costs can be direct, such as the time and money required to misrepresent information, or indirect and probabilistic, such as the loss of reputation and profits incurred by a media outlet if caught in a lie. For more examples about "fake news laws," see Funke and Famini (2018).

[3] In the "Killian document controversy," online blogs' revelation that CBS aired unauthenticated and forged documents was quickly rebroadcast by a wide spectrum of media. See Gentzkow and Shapiro (2008) for this and other examples.

[4] This is because most related work assumes that misreporting is either costless (e.g., in cheap talk models) or not possible (e.g., in disclosure models). See Sect. 2 for a review of the relevant literature.

produces distortions in policy outcomes, the informational and political effects of regulation need to be jointly determined.

I consider a model of strategic communication between a media outlet and a representative voter, where the policy alternatives available to the voter are endogenously championed by two competing candidates running for office. In the policy-making stage, the two candidates—an incumbent and a challenger—sequentially and publicly make a binding commitment to policy proposals. Afterwards, in the communication subgame, the media outlet delivers a public news report about the candidates' relative quality, where "quality" is defined as a candidate's fit with the state of the world. Given the proposals and the outlet's report, the voter casts a ballot for one of the two candidates. At the end, the policy proposed by the elected candidate gets implemented.

In contrast to canonical models of strategic communication, the media outlet bears a cost of misreporting its private information about candidates' quality that is increasing in the magnitude of misrepresentation. The voter and the outlet have aligned preferences over the relative quality of candidates (hereafter just "quality"), but disagree on which policy is the best. When candidates advance different proposals, there are contingencies in which there is a conflict of interest between the outlet and the voter. An agency problem emerges, as the outlet can strategically misreport information to induce the election of its favorite candidate and seize political gains at the expense of the voter.

The main results provide a number of policy implications by showing how the regulation of misreporting costs affects the voter's welfare. I find that there is no monotonic relationship between the probability that persuasion takes place and the voter's welfare, and between the probability that persuasion takes place and the costs of misreporting information. Interventions that increase such costs might induce more misreporting and more persuasion, and yet improve the voter's welfare because of the availability of better policies. Therefore, the growing concern that "proposed anti-fake news laws [...] aggravate the root causes fuelling the fake news phenomenon" (Alemanno 2018) is perhaps exaggerated. This also implies that the empirical task of inferring the efficiency of such interventions from the media's reporting behavior is challenging, if not impossible.

I also obtain conditions under which the voter is better off without a media outlet. Moreover, when the media's gains are policy-independent, an increase in the costs of misreporting information never harms the voter. However, a small incremental increase might have no effect at all on the voter's welfare. This result implies that, when carrying out interventions is costly, lenient regulatory efforts can be wasteful of public resources.

A natural question is whether politicians have the right incentives to propose interventions that benefit the voter.[5] To answer this question, I extend the main model by endogenizing the process of regulating misreporting costs, which takes place ahead of the policy-making stage. I show that the electoral incentives of politicians together with the sequential nature of policy proposals generate a friction in the regulatory

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[5] Most fake news laws are introduced by members of incumbent governments, ministers, or government factions (Funke and Famini 2018; Law Library of Congress 2019).

process which results in interventions that depress the voter's welfare. The worst-case scenario is obtained when the incumbent government is in charge of regulation: in this case, the incumbent sets low misreporting costs that trigger the convergence of proposals to the media outlet's favorite policy. Even though misreporting behavior is fully eradicated, the voter's welfare is at its minimum because of the induced policy distortion. From the voter's perspective, the resulting political outcome is abysmal, and equivalent to that of a dystopic scenario where the media outlet has the voting rights to directly decide upon which policy to implement and which candidate to elect. The situation is better, but still far from ideal, when the challenger is in charge of regulation.

The intuition behind the above results is as follows. As the costs of misreporting information decrease, both candidates offer more "biased" policies in the attempt to obtain the endorsement of an increasingly persuasive media outlet. The candidates' proposals become progressively closer to each other until, for sufficiently low misreporting costs, they fully converge on the outlet's preferred policy. More similar policies imply a smaller conflict of interest between the voter and the media outlet, and thus persuasion can occur in a smaller number of contingencies as costs decrease. Eventually, the convergence of proposals eradicates any conflict of interest as in these cases the only element that can differentiate candidates is their relative quality, over which preferences are aligned. Somewhat paradoxically, under low misreporting costs the media outlet has high persuasive potential and yet it fully reveals its private information about quality. However, the voter's welfare is damaged because perfect knowledge about quality—and thus perfect selection of candidates—comes at the cost of a large policy distortion. If candidates' quality is sufficiently less important than their policies, then the voter might be better off without a media outlet at all.

Policies converge to the media outlet's ideal policy when misreporting costs are sufficiently low. A substantial increase in these costs might trigger policy divergence and thus increase the contingencies in which there is a conflict of interest, making room for more misreporting and persuasion. In these cases, the voter's welfare can still increase because the loss of information about quality and the increased electoral mistakes may be more than compensated by the availability of better policies. When misreporting costs are sufficiently high, both candidates offer more popular policies to please the voter rather than the weakened media outlet. As costs increase further, the candidates' proposals tend to converge back toward the voter's preferred policy, mitigating the conflict of interest and the occurrence of misreporting and persuasion.

To see how electoral incentives skew the process of regulation, recall that policies are proposed sequentially. The presence of an influential media outlet transforms the policy-making stage in a sort of sequential rock-paper-scissors game where a moderate policy beats a popular one, a biased policy beats a moderate one, and a popular policy beats a biased one. Given the incumbent's proposal, the challenger has the second-mover advantage of seeking for either the voter's approval or the media outlet's support. When in charge of regulation, the incumbent can nullify this "incumbency disadvantage effect" by setting low misreporting costs to force policy

convergence.[6] Therefore, electoral incentives push politicians to use regulation for purely instrumental reasons, decreasing the voter's welfare as a result.

The remainder of this article is organized as follows. In Sect. 2, I discuss the related literature. Section 3 introduces the model, which I solve in Sect. 4. In Sect. 5, I analyze the voter's welfare and information. In Sect. 6, I discuss applications and extensions of the model. Section 7 concludes. Formal proofs are relegated to the Appendix.

2 Related literature

This paper is related to the literature studying the political economy of media bias.[7] Papers in this literature can be broadly split into two strands: models of demand-side and models of supply-side media bias. The first strand focuses on the case where news organizations are profit-maximizing and/or their preferences over political outcomes are second-order. Bias can emerge, for example, when media firms and journalists want to develop a reputation for accurate reporting (Gentzkow and Shapiro 2006; Shapiro 2016), consumers favor confirmatory news (Bernhardt et al. 2008; Mullainathan and Shleifer 2005), or voters demand biased information (Calvert 1985; Oliveros and Várdy 2015; Suen 2004). Here, I take a supply-side approach by considering a media outlet that has preferences over political outcomes. In this second strand, bias originates from the intrinsic preferences and motivations of agents who work for news organizations, like editors and owners. For example, media bias occurs when journalists have ideological leanings (Baron 2006), media firms suppress unwelcome news (Anderson and McLaren 2012; Besley and Prat 2006), or politicians design public signals (Alonso and Camara 2016).

The above-mentioned papers abstract from the process of policy-making and political competition. By contrast, I explicitly incorporate an electoral stage where candidates compete via binding commitments to policy proposals. For this reason, the present paper is more closely related to the stream of work studying the effects of political endorsements on policy outcomes. Within this part of the literature but in contrast to the present paper, Grossman and Helpman (1999), Gul and Pesendorfer (2012), and Chakraborty et al. (2020) consider voters that are uncertain about their own preferences; Carrillo and Castanheira (2008) and Boleslavsky and Cotton (2015) model the source of information about candidates as exogenous; Andina-Díaz (2006) models voting behavior as exogenous; Miura (2019) considers a media outlet that delivers fully certifiable information about candidates' policies; Bandyopadhyay et al. (2020), Chan and Suen (2008), and Strömberg (2004) study a demand-side framework; Ashworth and Shotts (2010) and Warren (2012) use a political agency framework to study how a media outlet affects the incumbent's incentives to pander. Differently, in this paper I use a supply-side model where voters know their preferences, the behavior

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[6] There is empirical evidence of both media's anti-incumbent behavior (Puglisi 2011) and of an "incumbency disadvantage" effect due to media coverage (Green-Pedersen et al. 2017). However, evidence is mixed as other work finds that the media has either no clear effect (Gentzkow et al. 2011) or a positive effect on the re-election chances of incumbent politicians (Drago et al. 2014).

[7] For comprehensive surveys on the topic, see Prat and Strömberg (2013) and Gentzkow et al. (2015).

of candidates, voters, and the media is endogenous, and information about the state can be misreported.

In this paper, the presence of an influential media outlet distorts the candidates' policies. Policy distortion decreases the voter's welfare to the point that the voter may be better off without media. Similarly, Chakraborty and Ghosh (2016), Alonso and Camara (2016), and Boleslavsky and Cotton (2015) show that the media's presence can harm voters. In Bandyopadhyay et al. (2020), the voter is weakly better off without media. Gul and Pesendorfer (2012) show that a single media generates policy convergence and leads to an uninformed electorate. In Chakraborty et al. (2020), experts' partisan endorsements yield policy convergence, but not at the voter's ideal policy, thus damaging the average voter. Carrillo and Castanheira (2008) show that a strategic press may induce parties to choose inefficient policies. By contrast, here the media may generate diverging policies that can simultaneously lead to more disinformation and higher voter's welfare.[8] The media's presence benefits the voter if misreporting costs are sufficiently high.[9]

The most closely related paper is Chakraborty and Ghosh (2016). They use a Downsian framework to study the welfare effects of a policy-motivated media outlet that can influence voting behavior via cheap talk endorsements. The present paper is different in three important aspects: first, I incorporate costs for misreporting information that are proportional to the magnitude of misrepresentation. Under this approach, a news report is more than just an endorsement as it constitutes a costly signal of the state. Second, I study a sequential rather than a simultaneous model of electoral competition. As a result, I obtain that the policy of the incumbent is subject to a different distortion than that of the challenger. I show that this difference plays an important role when endogenizing the process of regulation. Finally, the welfare analysis in Chakraborty and Ghosh (2016) focuses on the ideological conflict between the media outlet and the voter, while I focus on the intensity of misreporting costs and its regulation.

The key feature of the present paper is how communication is modeled. Papers in the previously mentioned literature consider media outlets that either can report anything without bearing any direct consequence on their payoffs (e.g., Chakraborty and Ghosh, 2016; Gul and Pesendorfer, 2012) or cannot misreport information at all (e.g., Besley and Prat, 2006; Duggan and Martinelli, 2011). By contrast, I consider a media outlet that can misreport information but at a cost. In addition to incorporating a realistic feature, this modeling strategy allows me to perform comparative statics on misreporting costs that are currently unexplored, yet crucial for understanding the regulation of news markets. In this regard, Edmond and Lu (2021) constitute an exception: they analyze a model where a politician with no directional bias can manipulate information at a cost to prevent voters from becoming well-informed. They study

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[8] In a public good setting, Barbieri (2023) shows that less accurate information may have a positive effect on activities that display complementarity, such as protests.

[9] The media can be detrimental even in models with exogenous policies. For example, Gentzkow and Shapiro (2006) show that the media's reputational concerns can harm voters. In Baron (2006), media bias has ambiguous welfare effects. In Alonso and Camara (2016), most voters can be strictly worse off due to the sender's influence. An increased media presence can benefit voters by deterring its capture (Besley and Prat 2006), but it can also harm media independence from political influence (Trombetta and Rossignoli 2021). Media competition can harm voters by increasing social disagreement (Perego and Yuksel 2022).

the effects of a shock that increases the intrinsic precision of voters' information and simultaneously decreases the politician's manipulation costs. Differently, I consider a media outlet known to prefer a specific candidate. Importantly, here the media and voter's preferences over candidates are endogenously determined through a process of policy-making.

The present paper also touches upon the literature on strategic communication with lying costs (Chen 2011; Kartik et al. 2007; Kartik 2009; Ottaviani and Squintani 2006).[10] With respect to this line of work, I consider a setting where the voter (i.e., the receiver) has a binary action space and the outlet (i.e., the sender) has a continuous message space. Moreover, the state-contingent value of the alternatives is endogenously determined through a process of electoral competition, and not exogenously given. This framework gives rise to a number of important qualitative differences in the amount of information transmitted and the language used in equilibrium: I obtain equilibria where persuasion naturally occurs even within large state and report spaces; the sender might invest costly resources to misreport even in the (interim) absence of a conflict of interest with the receiver; full information revelation occurs with relatively low misreporting costs.[11] These features are key for the main results of the present paper.

Finally, Balbuzanov (2019) and Hodler et al. (2014) identify a non-monotonicity in the sender's persuasiveness that is similar to the one I describe in Sect. 5. In Balbuzanov (2019), a higher probability of lie-detection may decrease the receiver's welfare, whereas a relatively low lie-detection probability can yield full revelation. In Hodler et al. (2014), the bound on the sender's report space becomes tight when misreporting costs are low, and thus the sender's inflated messages reach the bound. Lower misreporting costs make the sender less credible without allowing him to misreport in more states. As a result, lower costs can be associated with less persuasion and a higher welfare for the receiver. The non-monotonicity result I obtain is logically independent from that in these papers, and it has different welfare implications: the voter is better off with higher misreporting costs even when they generate more misreporting and persuasion.

3 The model

There are four players: a representative voter v, a media outlet m, and two candidates: an incumbent i, and a challenger c. The voter has to cast a ballot $b \in \{i, c\}$ for one of the two candidates. At the outset, in the "policy-making stage," each candidate makes a binding and public commitment to a policy proposal. I assume that proposals

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[10] The presence of misreporting costs makes this a model of partial commitment. Results show that higher costs make the voter better off. Relatedly, Min (2021) studies the welfare implications of partial commitment in a persuasion framework, showing that the receiver can be better off as the sender's commitment power strengthens.

[11] With a coarse action space, the outlet can achieve persuasion by pooling information to make the voter indifferent between two actions. Similarly, Chen (2011) obtains "message clustering" in a setting with a continuous action space and a coarse message space. Kartik (2009) finds partial separation in a bounded type space setting. Kartik et al. (2007) and Ottaviani and Squintani (2006) show that full separation is achieved when such a bound is arbitrarily large.
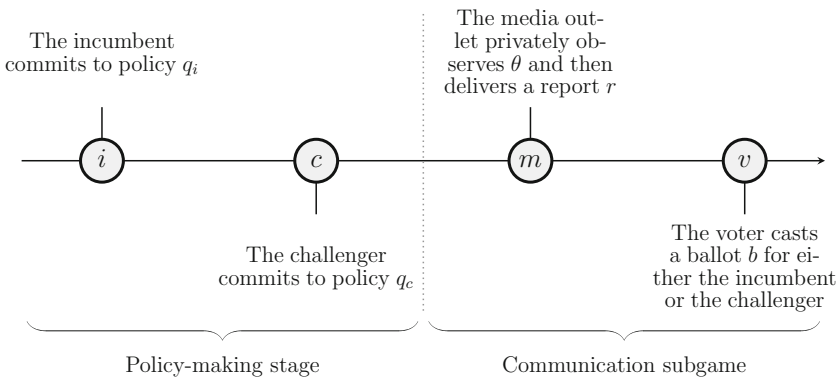
The incumbent
commits to policy q_i

The media out-
let privately ob-
serves θ and then
delivers a report r

i c m v

The challenger
commits to policy q_c

The voter casts
a ballot b for ei-
ther the incumbent
or the challenger

Policy-making stage   Communication subgame

Fig. 1 Timeline of the model

are sequential: the incumbent first commits to a policy $q_i \in \mathbb{R}$; after observing q_i, the challenger commits[12] to a policy $q_c \in \mathbb{R}$. Policy proposals $q = (q_i, q_c)$ are then publicly observed by all players. If the voter casts a ballot b for candidate $j \in \{i, c\}$, then policy q_j is eventually implemented.

The "communication subgame" takes place after the candidates' commitments but before the election: the media outlet privately observes the realization of a state $\theta \in \Theta$ and then delivers a news report $r \in \mathbb{R}$. Reports are literal statements about the state. Before casting a ballot, the voter observes the report r but not the state θ. Figure 1 illustrates the timing structure of the model.

The state The state θ represents the relative quality of the incumbent with respect to the challenger, and I shall hereafter refer to θ simply as "quality." I assume that θ is randomly drawn from a uniform density function f over $\Theta = [-\phi, \phi]$, where f is common knowledge to all the players. Only the media outlet privately observes the realized state θ. The voter and the media outlet have identical preferences over quality: given any proposals $q = (q_i, q_c)$, the higher the quality is, the higher is the gain from the incumbent winning the election rather than the challenger. Thus, quality is an element of vertical differentiation similar in kind to what is known in political theory as "valence."[13]

Payoffs Candidates are purely office-seeking, and care only about their own electoral victory. I assume that candidates obtain a utility of 1 if they win and 0 otherwise. The utility of candidate $j \in \{i, c\}$ is thus[14] $u_j(b) = \mathbb{1}\{b = j\}$.

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[12] The assumption of sequentiality in the policy-making process reflects that candidates announce their policies at distinct points in time, and that the incumbent's policy is typically formed or known before the challenger's. See, e.g., Wiseman (2006). I relax this assumption in Sect. 6.3.

[13] Quality captures the candidates' fit with the state of the world. For a discussion of the closely related notion of valence or character, see, e.g., Stokes (1963), Kartik and McAfee (2007), and Chakraborty and Ghosh (2016), among others.

[14] $\mathbb{1}\{\cdot\}$ is the indicator function, where $\mathbb{1}\{A\} = 1$ if A is true, and 0 otherwise.

The voter and the media outlet have a preferred "bliss" policy of $\varphi_v \in \mathbb{R}$ and $\varphi_m \in \mathbb{R}$, respectively.[15] I assume without loss of generality that $\varphi_m < \varphi_v$, and denote with $\gamma > 0$ a parameter weighting the relative importance of policies to quality. The voter's utility $u_v(b, \theta, q)$ from selecting candidate $b \in \{i, c\}$ when quality is θ and proposals are $q = (q_i, q_c)$ is an additively separable combination of standard single-peaked policy preferences and quality, i.e.,

$$u_v(b, \theta, q) = -\gamma(\varphi_v - q_b)^2 + \mathbb{1}\{b = i\}\theta.$$

Therefore, given proposals q, the voter prefers to vote for the incumbent only if quality is high enough, i.e., only if $\theta > \tau_v(q) = \gamma(2\varphi_v - q_c - q_i)(q_c - q_i)$. The threshold $\tau_v(q)$ is obtained from solving $u_v(i, \theta, q) = u_v(c, \theta, q)$ for θ.

I consider two types of preferences for the media outlet: ideological and pragmatic. In both cases, the media's preferences over candidates are analogous as the voter's. I similarly define $\tau_m(q) = \gamma(2\varphi_m - q_c - q_i)(q_c - q_i)$ and refer to $\tau_j(q)$ as player j's threshold, for $j \in \{v, m\}$. Given policies q and state θ, the media outlet's preferred candidate is

$$\hat{m}(\theta, q) = \begin{cases} i & \text{if } \theta > \tau_m(q) \\ c & \text{if } \theta < \tau_m(q) \\ \varnothing & \text{if } \theta = \tau_m(q). \end{cases}$$

I denote by $\xi(\theta, q)$ the gains obtained by the outlet when its preferred candidate $\hat{m}(\theta, q)$ ends up winning the election. An *ideological* media's electoral gains are similar to the voter's. Specifically, the outlet obtains $-\gamma(\varphi_m - q_i)^2 + \theta$ when the voter elects the incumbent, and obtains $-\gamma(\varphi_m - q_c)^2$ otherwise. As a result, the political gains that an ideological media outlet can obtain when the state is θ and policies are q are $\xi(\theta, q) = |\tau_m(q) - \theta|$. Differently, a *pragmatic* media's gains are policy-independent, and $\xi(\theta, q) = \hat{\xi}$. To sum up,

$$\xi(\theta, q) = \begin{cases} |\tau_m(q) - \theta| & \text{if the media outlet is ideological} \\ \hat{\xi} > 0 & \text{if the media outlet is pragmatic.} \end{cases}$$

The media's decision of misreporting information depends on one additional parameter: I denote by $k > 0$ a scalar measuring the intensity of misreporting costs. The media outlet, ideological or pragmatic, gets an overall utility of $u_m(r, b, \theta, q)$ when delivering report r in state θ with proposals q and winning candidate b, where

$$u_m(r, b, \theta, q) = \mathbb{1}\{b = \hat{m}(\theta, q)\}\xi(\theta, q) - k(r - \theta)^2.$$

Importantly, the media outlet incurs a cost of $k(r - \theta)^2$ for delivering a news report r when the state is θ. Any report $r \in \mathbb{R}$ has the literal or exogenous meaning "quality is

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[15] The model can allow for the presence of a finite committee or a continuum of voters where v is the median voter with bliss policy φ_v. Under a majority voting rule with two alternatives, the assumption of sincere voting is without loss of generality, as in such cases truth-telling is a dominant strategy.

equal to r." Truthful reporting occurs when $r = \theta$, and it is assumed to be costless. By contrast, misreporting information is costly, and the associated costs are increasing with the difference between the stated and the true realization of quality. The score k encapsulates all those elements determining the magnitude of misreporting costs, such as reputation concerns, resources required for misrepresenting information, and the stringency of fake news laws. With some abuse of language, I will hereafter interchangeably refer to k as "misreporting costs" or "costs' intensity."[16]

Influential news The media outlet is influential only if the voter's sequentially rational decision is not constant along the equilibrium path. A relatively small state space may make the outlet non-influential or limit its signal possibilities. To ensure that this is not the case, I assume that the state space is relatively large, i.e., $\phi \geq 3\gamma(\varphi_v - \varphi_m)^2$. Intuitively, a larger state space implies more uncertainty over quality and thus a more prominent role for an informed outlet. This assumption is sufficient to guarantee that in equilibrium the outlet is influential and that candidates cannot gain from proposing policies that make the outlet superfluous or that restrict the outlet's signaling capacity.[17]

Strategies A strategy for the incumbent is a binding commitment to a policy proposal $q_i \in \mathbb{R}$; a strategy for the challenger is a function $q_c : \mathbb{R} \to \mathbb{R}$ that assigns a policy $q_c \in \mathbb{R}$ to each incumbent's proposal q_i. I assume that candidates cannot condition their proposals on the state or on the outlet's reports.[18] A reporting strategy for the media outlet is a function $\rho : \Theta \times \mathbb{R}^2 \to \mathbb{R}$ that associates a news report $r \in \mathbb{R}$ to every tuple of proposals $q \in \mathbb{R}^2$ and quality $\theta \in \Theta$. I say that a report r is off-path if, given strategy ρ, r will not be observed by the voter. Otherwise, I say that r is on-path. A belief function for the voter is a mapping $p : \mathbb{R} \times \mathbb{R}^2 \to \Delta(\Theta)$ that, given any news report $r \in \mathbb{R}$ and policies $q \in \mathbb{R}^2$, generates posterior beliefs $p(\theta \mid r, q)$, where p is a probability density function. Given policies q, report r, and posterior beliefs p, the voter casts a ballot for a candidate in the sequentially rational set $\beta(r, q)$, where

$$\beta(r, q) = \arg\max_{b \in \{i,c\}} \mathbb{E}_p[u_v(b, \theta, q) \mid q, r].$$

Solution concept The solution concept is the perfect Bayesian equilibrium (PBE), refined by the Intuitive Criterion (Cho and Kreps 1987).[19] For most of the analysis, I focus on the sender-preferred equilibrium defined as follows: when the voter is indifferent between the two candidates at a given belief, she selects the one supported by the media outlet; when a candidate is indifferent between some proposals, she advances the policy closest to the outlet's bliss φ_m. Given the potential conflict of interest between the voter and the media outlet, the sender-preferred equilibrium is

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[16] In Appendix A.1, I use a more general cost function and prior to find the equilibria of the communication subgame (Proposition A.1).

[17] See Corollary A.1 in Appendix A.2.1.

[18] This assumption is in line with the idea that all uncertainty about quality is publicly resolved only after policy implementation, and policies cannot be easily changed in the short run. Moreover, candidates cannot credibly and profitably condition their proposals on the media outlet's reports.

[19] For a textbook definition of PBE and Intuitive Criterion, see Fudenberg and Tirole (1991). A formal definition of Intuitive Criterion is also provided in Appendix A.1.

also the least preferred by the voter. The focus on this type of equilibrium provides a useful benchmark consisting of the voter's worst-case scenario, which is key for the robust-control approach to policy analysis (Hansen and Sargent 2008). Moreover, it selects the unique perfect sequential equilibrium (Grossman and Perry 1986) of the communication subgame. I hereafter refer to a sender-preferred PBE robust to the Intuitive Criterion simply as "equilibrium."

3.1 Discussion of assumptions

This section discusses the assumptions on the model's payoff and information structure. Section 6.3 further looks at several variations of the baseline model to perform robustness checks, showing that most qualitative findings are robust to the model's specifications.

Media's payoff The model considers two possible payoff configurations for the media outlet. In the first configuration, the media is ideological and has preferences similar to the voter. As a consequence, the resources that an ideological media is willing to invest in misreporting depend on both the policies and realized state. This scenario represents situations where the policies directly affect the media outlet's welfare. This is the case, for example, when candidates' proposals concern tax rates, subsidies, or media regulation. Whoever controls the media outlet's reporting strategy (e.g., the editor) is ideologically aligned with the media outlet.

In the second configuration, the media is referred to as pragmatic because its gains are independent of the candidates' proposals and quality. Consequently, the resources that a pragmatic media is willing to invest in misreporting are exogenously capped. However, the media's preferences over candidates are determined in a similar way as the voter's. This scenario represents situations where political endorsements are decided by an ideological actor, whereas budget considerations are apolitical. This is the case, for example, when editors, owners, and journalists have political leanings on issues such as abortion or gay marriage, which may have no direct impact on the media organization itself. The outlet can still garner benefits by supporting the election of a candidate. These benefits take the form, e.g., of bribes and favors that are policy- and state-independent.[20]

In many circumstances, media outlets can be thought of as having a mix of ideological and pragmatic incentives. That is, their gains may be partly affected by policies and, in part, fixed. For this reason, it is important to study the two polar cases where outlets are either ideological or pragmatic. Moreover, findings for the pragmatic media case are instrumental in proving findings for the ideological media case. This paper shows that most results obtained under these two alternative payoff configurations are qualitatively similar and robust to extensions.

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[20] Alternatively, $\hat{\xi}$ may indicate the avoided losses that the outlet would expect to incur when opposing the winning candidate. For example, after the publication of the first stories about the Watergate scandal, President Nixon allegedly said "The *Post* is going to have damnable, damnable problems out of this one. They have a television station. …and they're going to have to get it renewed." See references in (Gentzkow and Shapiro 2008, p. 136).

Information structure The distributional assumption on θ implies that, during the policy-making stage, both the candidates and the voter have uninformative priors about the candidates' relative quality. The media outlet privately learns the realized state only after candidates commit to policy proposals. The state encapsulates electorally-relevant information that realizes after the production of proposals and before the election, such as, e.g., events covered by the media during the electoral campaign. By assumption, the candidates have no private information about the realized state; otherwise, they could condition their policy proposals on such information. The following is the main interpretation of this information structure: the candidates' characteristics are publicly known, but it is not sure how their traits will advantage them in the future. Thus, θ represents the state of the world in which the winning candidate will have to operate.

Other assumptions Sect. 6.2 extends the model by endogenizing the regulation process, which determines the misreporting costs' intensity, k. Section 6.3 extends the baseline model to cases where there are multiple informed media outlets, the media has preferences similar to the voter's, withholding information is possible, and policies are proposed simultaneously. I also discuss the suitability of the equilibrium concept in use.

4 Equilibrium

I present the main equilibrium analysis in two parts: in Sect. 4.1, I begin by solving for the equilibrium of the final communication subgame where, given any fixed pair of policies, the media outlet delivers to the voter a news report about the candidates' quality. In Sect. 4.2, I proceed by studying the equilibrium of the policy-making stage, where candidates sequentially commit to policy proposals. Formal proofs are relegated to Appendix A.1 and Appendix A.2.

4.1 The communication subgame

The communication subgame takes place after both candidates commit to policy proposals. The media outlet privately observes the candidates' relative quality θ and then delivers a news report r consisting of a literal statement about θ. The voter, after observing the outlet's report but not the candidates' quality, casts a ballot for either the incumbent or the challenger. For convenience, I denote the communication subgame by $\hat{\Gamma}$.

Given proposals q, the media outlet has a conflict of interest with the voter when quality is between the thresholds $\tau_j(q)$, $j \in \{m, v\}$. Consider for example the case where policies q are such that[21] $\tau_m(q) > \tau_v(q)$. When $\theta > \tau_m(q)$ (resp. $\theta < \tau_v(q)$), the voter and the outlet both agree that the best candidate is the incumbent (resp. the challenger). By contrast, when $\theta \in (\tau_v(q), \tau_m(q))$ the voter prefers the incumbent while the outlet prefers the challenger. Since the voter cannot observe the realized

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[21] We have that $\tau_m(q) > \tau_v(q)$ when $q_c < q_i$, $\tau_m(q) < \tau_v(q)$ when $q_c > q_i$, and $\tau_m(q) = \tau_v(q)$ when $q_c = q_i$. In the latter case, there is no conflict of interest between the media outlet and the voter.
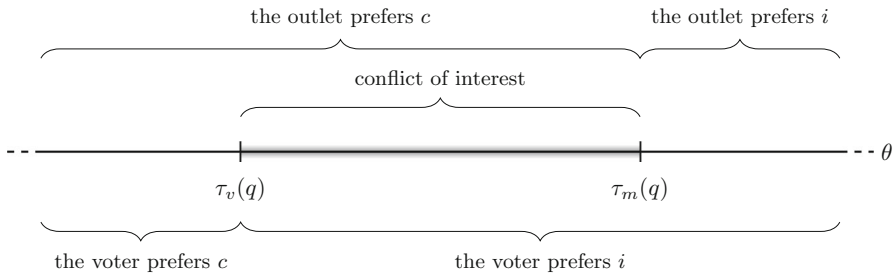
Fig. 2 The media outlet and the voter's favorite candidate for different levels of quality. The states in which there is a conflict of interest are highlighted in gray

quality, she is uncertain about whether a conflict of interest exists or not. Figure 2 illustrates the preferred candidate of the media outlet and the voter across different states and for the case $\tau_m(q) > \tau_v(q)$.

The media outlet can misreport its private information about quality to induce the election of its preferred candidate $\hat{m}(q, \theta)$ and seize the gains $\xi(\theta, q)$. Denote by $\hat{\Theta}(q)$ the set of states that lie strictly between the thresholds $\tau_j(q)$, $j \in \{m, v\}$. If the media outlet delivers a report that induces the election of its preferred candidate when there is a conflict of interest, then I say that persuasion has occurred.

Definition 1 (Persuasion) The media outlet persuades the voter if $\beta(\rho(\theta, q), q) = \hat{m}(\theta, q)$ for some $\theta \in \hat{\Theta}(q) = (\min\{\tau_v(q), \tau_m(q)\}, \max\{\tau_v(q), \tau_m(q)\})$.

Intuitively, persuasion occurs when the voter selects the media outlet's preferred candidate while, under complete information, she would have preferred the other candidate. This definition differs from that employed by other papers. The term "persuasion" is often used to denote situations where the receiver (voter) takes an action that, absent information provided by the sender (media), she would not have taken. Moreover, such a term is often—but not exclusively—used in frameworks where information is fully verifiable, misreporting is not possible, and senders have commitment power (such as, e.g., in games of verifiable disclosure or Bayesian persuasion models). Differently, in the current paper information is partially verifiable, misreporting is possible, and the media outlet has no commitment-power.[22]

Since misreporting is costly, there is a limit to the reports that the outlet can profitably deliver in a certain state. Therefore, differently than in cheap talk games, reports' informational content is not arbitrarily determined by the voter's strategic inference. Consider a news report, $r > \tau_m(q)$, suggesting that quality is sufficiently high for the outlet to support the incumbent. Suppose now that r leads to the electoral victory of the incumbent, $\beta(r, q) = i$. I define the *lowest misreporting type $l(r)$* as the highest state in which the outlet does not obtain strictly positive gains from delivering the

---

[22] Furthermore, here persuasion differs from "influential communication" as defined in Sect. 3. For example, a media outlet that consistently and credibly reports truthfully is influential but never persuasive. As we shall see, there are no equilibria where the outlet consistently reports truthfully.

news report r. More formally, for some report $r > \tau_m(q)$ such that $\beta(r, q) = i$,

$$
l(r) = \begin{cases} r + \frac{1}{2k}\left[1 - \sqrt{1 + 4k(r - \tau_m(q))}\right] & \text{if } \xi(\theta, q) = |\tau_m(q) - \theta| \\ \max\left\{r - \sqrt{\hat{\xi}/k}, \ \tau_m(q)\right\} & \text{if } \xi(\theta, q) = \hat{\xi}. \end{cases} \tag{1}
$$

In equilibrium, the voter understands that such a report r could not be profitably delivered if quality is lower than $l(r)$, and should accordingly place probability zero on every $\theta < l(r)$. I similarly define the *highest misreporting type* $h(r)$ as the lowest state in which the outlet does not obtain strictly positive gains from delivering a news report $r < \tau_m(q)$ such that $\beta(r, q) = c$. Formally,

$$
h(r) = \begin{cases} r - \frac{1}{2k}\left[1 - \sqrt{1 + 4k(\tau_m(q) - r)}\right] & \text{if } \xi(\theta, q) = |\tau_m(q) - \theta| \\ \min\left\{r + \sqrt{\hat{\xi}/k}, \ \tau_m(q)\right\} & \text{if } \xi(\theta, q) = \hat{\xi}. \end{cases} \tag{2}
$$

I can now present the main result of this section: in the equilibrium of the communication subgame $\hat{\Gamma}$, the media outlet "jams" information by delivering the same pooling report $r^*(q)$ whenever quality takes values around the voter's threshold $\tau_v(q)$. Otherwise, when quality is relatively far from $\tau_v(q)$, the outlet always reports truthfully. When observing the pooling report $r^*(q)$, the voter 's expectation about quality is exactly $\tau_v(q)$, and therefore she is indifferent between the two candidates.[23] This result helps us to find the candidates' equilibrium probability of electoral victory given any pair of proposals q.

Lemma 1 *The equilibrium of the communication subgame $\hat{\Gamma}$ is a pair $(\rho(\theta, q), p(\theta \mid r, q))$ such that, given policy proposals[24] q,*

(i) If $\tau_v(q) < \tau_m(q)$, then

$$
\rho(\theta, q) = \begin{cases} r^*(q) = \left\{r \in \Theta \mid \mathbb{E}_f[\theta \mid \theta \in (r, h(r))] = \tau_v(q)\right\} & \text{if } \theta \in (r^*(q), h(r^*(q))) \\ \theta & \text{otherwise.} \end{cases}
$$

(ii) If $\tau_v(q) > \tau_m(q)$, then

$$
\rho(\theta, q) = \begin{cases} r^*(q) = \left\{r \in \Theta \mid \mathbb{E}_f[\theta \mid \theta \in (l(r), r)] = \tau_v(q)\right\} & \text{if } \theta \in (l(r^*(q)), r^*(q)) \\ \theta & \text{otherwise.} \end{cases}
$$

(iii) If $\tau_v(q) = \tau_m(q)$, then $\rho(\theta, q) = \theta$ for all $\theta \in \Theta$.

---

[23] In the sender-preferred equilibrium, the voter selects the candidate preferred by the media outlet when indifferent. Therefore, the voter never mixes.

[24] Up to changes of measure zero in $\rho(\theta, q)$ due to the media outlet being indifferent between reporting $l(r^*(q))$ and $r^*(q)$ (resp. $h(r^*(q))$ and $r^*(q)$) when the state is $\theta = l(r^*(q)) > \tau_m(q)$ and $\tau_m(q) < \tau_v(q)$ (resp. $\theta = h(r^*(q)) < \tau_m(q)$ and $\tau_m(q) > \tau_v(q)$).

(iv) Posterior beliefs $p(\theta \mid r, q)$ are according to Bayes' rule whenever possible and such that $\mathbb{E}_p[\theta \mid q, r^*(q)] = \tau_v(q)$; for every off-path r, $\mathbb{E}_p[\theta \mid q, r] < \tau_v(q)$ when $\tau_v(q) > \tau_m(q)$, and $\mathbb{E}_p[\theta \mid q, r] > \tau_v(q)$ when $\tau_v(q) < \tau_m(q)$; otherwise, $p(\theta \mid r, q)$ are degenerate at $\theta = r$. As a result, when $\tau_v(q) > \tau_m(q)$, then $\beta(r, q) = i$ iff $r \geq r^*(q)$; when $\tau_v(q) < \tau_m(q)$, then $\beta(r, q) = c$ iff $r \leq r^*(q)$; when $\tau_v(q) = \tau_m(q)$, then $\beta(r, q) = i$ iff $r \geq \tau_v(q)$.

To understand the intuition behind Lemma 1, consider the case where proposals q are such that $\tau_v(q) < \tau_m(q)$, and suppose that there exists a fully revealing equilibrium in truthful strategies, where $\rho(\theta, q) = \theta$ for every $\theta \in \Theta$. When quality is slightly higher than the voter's threshold $\tau_v(q)$, the media outlet can deliver some report $r \leq \tau_v(q)$ such that the incurred misreporting costs are lower than the gains obtained from supporting the winning candidate, i.e., $k(r - \theta)^2 < \xi(\theta, q)$. Given the truthful reporting rule $\rho(\theta, q)$, the voter takes the outlet's reports at face value, and thus casts a ballot for the challenger after observing any $r \leq \tau_v(q)$. The outlet has a strictly profitable deviation, implying that in equilibrium there must be misreporting in some state.

Misreporting is a costly activity, and therefore the media outlet misreports only if doing so induces the electoral victory of its preferred candidate $\hat{m}(\theta, q)$. Moreover, if it is profitable for the outlet to deliver a report $r' < \tau_m(q)$ when quality is $\theta' \in (r', \tau_m(q))$, then reporting r' must be profitable for all $\theta \in [r', \theta']$. This suggests that in equilibrium the outlet "pools" information about quality by delivering the same report $r^*(q)$ for different states in a convex set $S(r^*(q))$ such that $\hat{m}(\theta', q) = \hat{m}(\theta'', q)$ for all $\theta', \theta'' \in S(r^*(q))$.

Upon observing the pooling report $r^*(q)$, the voter infers that the realized quality is in the set $S(r^*(q))$. If the voter's expectation about quality $\mathbb{E}_p[\theta \mid q, r^*(q)]$ is greater than her threshold $\tau_v(q)$, then she casts a ballot for the incumbent; otherwise she votes for the challenger. By pooling states around $\tau_v(q)$ in a way such that $\mathbb{E}_p[\theta \mid q, r^*(q)] \leq \tau_v(q)$, the outlet can induce the election of the challenger even when quality is such that the voter's preferred candidate is the incumbent. That is, the outlet can achieve persuasion by pooling information about quality.

The voter's response to off-path reports plays a central role in sustaining the equilibrium. Upon receiving an unexpected report, the voter reacts with skepticism. When the media outlet is more inclined to prefer the challenger (i.e., $\tau_v(q) < \tau_m(q)$), the voter casts a ballot for the incumbent after receiving reports that are off the equilibrium path. Specifically, off-path beliefs are such that the voter expects quality to be higher than her threshold $\tau_v(q)$ when the outlet delivers reports in the set $(r^*(q), h(r^*(q)))$. The voter's skepticism guarantees that the media outlet cannot profitably deviate from its prescribed equilibrium reporting strategy. Without skepticism, there would be states where the outlet prefers to deliver an off-path report rather than the more expensive pooling report $r^*(q)$.

The candidate supported by the media outlet is more likely to be elected when the pooling report $r^*(q)$ makes the voter just indifferent between casting a ballot for the incumbent and the challenger: pooling reports that induce lower expectations have the same effect on the voter's choice but are more expensive to deliver when there is a conflict of interest. Therefore, in equilibrium the outlet misreports by delivering a

pooling report $r^*(q)$ that jams states around the voter's threshold in a way such that $\mathbb{E}_p[\theta \mid q, r^*(q)] = \tau_v(q)$.

This pooling strategy prescribes the outlet to misreport even in states where there is no conflict of interest. Even though at first it might seem counter-intuitive, this reporting behavior is consistent with strategic skepticism: the voter, being aware of the media outlet's leaning and misreporting technology, demands sufficiently strong evidence that quality is low enough for the challenger to be elected. When quality is just slightly below $\tau_v(q)$, the outlet must nevertheless misreport to overcome the voter's skepticism.

By contrast, truthful reporting always occurs when quality takes extreme values that are relatively far from the voter's threshold $\tau_v(q)$. There are two possibilities in this case: either there is a conflict of interest, or the interests of the outlet and the voter are aligned. In the former case, misreporting is not convenient for the outlet as it would be prohibitively costly to deliver a report that induces the election of its preferred candidate. In the latter case, the outlet does not need to misreport because the true realization of quality is a sufficiently discriminating signal for the voter be trustful.

Lemma 1 shows that, given proposals q, the media outlet persuades the voter when $\theta \in (\tau_v(q), h(r^*(q)))$ if $\tau_v(q) < \tau_m(q)$ and when $\theta \in (l(r^*(q)), \tau_v(q))$ if $\tau_v(q) > \tau_m(q)$. If $\tau_v(q) = \tau_m(q)$, then there cannot be persuasion since the outlet and the voter always agree on which candidate is best. By contrast, I say that the outlet exerts "full persuasion" if persuasion occurs in every state in which there is a conflict of interest.

Definition 2 (Full persuasion) The media outlet exerts full persuasion if $\beta(\rho(\theta, q), q) = \hat{m}(\theta, q)$ for all $\theta \in \hat{\Theta}(q)$.

The media outlet is fully persuasive if, given policy proposals q, the misreporting costs k are low enough to make persuasion affordable in every state where there is a conflict of interest. Consider first the ideological media case. From Eqs. (1) and (2), we can see that an ideological media obtains full persuasion only when misreporting costs shrink to zero.[25] Differently, a pragmatic media outlet obtains full persuasion as long as the misreporting costs are sufficiently low. Formally, there is full persuasion in the pragmatic media case if $k \in \left(0, \hat{k}(q)\right]$, where[26]

$$\hat{k}(q) = \frac{\hat{\xi}}{4(\tau_v(q) - \tau_m(q))^2}.$$

Alternatively, a pragmatic outlet exerts full persuasion if, given misreporting costs k, the proposals q_i and q_c are sufficiently close to each other. Intuitively, as candidates' policies become more similar, the preferences of the voter and the outlet become more aligned, and the set of states in which there is a conflict of interest becomes smaller. Since the pragmatic outlet's potential gains $\hat{\xi}$ are fixed, the share of states in which persuasion occurs under a conflict of interest increases as proposals get closer. If

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[25] We have $l(r) \to \tau_m(q)$ and $h(r) \to \tau_m(q)$ as $k \to 0^+$, whereas $l(r) > \tau_m(q) > h(r)$ for every $k > 0$.

[26] The cost threshold $\hat{k}(q)$ is obtained by setting in the pragmatic media case $h(r^*(q)) = \tau_m(q)$ for $\tau_v(q) < \tau_m(q)$ or $l(r^*(q)) = \tau_m(q)$ for $\tau_v(q) > \tau_m(q)$, where $r^*(q)$ is defined as in Lemma 1.

policies are sufficiently similar, then persuasion occurs every time there is a conflict of interest. Formally, there is full persuasion in the pragmatic media case when proposals q are such that

$$(q_c - q_i)^2 \leq \frac{\hat{\xi}}{16\gamma^2(\varphi_m - \varphi_v)^2 k}. \tag{3}$$

Figure 3 shows the equilibrium reporting rule of Lemma 1 for different policies and misreporting costs. In panel (a), the outlet is more likely than the voter to prefer the challenger and misreporting costs are relatively high. In this case, the media outlet discredits the incumbent by delivering a report that "belittles" realizations of quality around the voter's threshold $\tau_v(q)$. With this strategy, the outlet achieves persuasion in those states that the figure indicates with the letter (B). By contrast, truthful reporting occurs despite a conflict of interest in states that are indicated with (C): in these cases, persuasion is prohibitively expensive because of the relatively high misreporting costs $k > \hat{k}(q)$. In states that are indicated with (A), the outlet spends resources to misreport information even though no conflict of interest is in place. These "white lies" are the result of the voter's skepticism about news reports that are not sufficiently discriminatory.

Panel (b) of Fig. 3 shows the equilibrium reporting rule when the pragmatic outlet is more likely than the voter to prefer the incumbent and misreporting costs are relatively low. In this case, the media outlet supports the incumbent by delivering reports that "exaggerate" realizations of quality[27] around the voter's threshold $\tau_v(q)$. Low misreporting costs allow the outlet to exert full persuasion and induce the election of its preferred candidate every time there is a conflict of interest. As before, states in which the outlet delivers white lies are indicated with (A), while states in which the outlet persuades the voter are marked by (B).

4.2 The policy-making stage

Consider now the policy-making stage, where candidates sequentially make a binding commitment to a policy proposal. Since candidates are purely office-seeking, they advance policies to maximize their chances of getting elected. The result in the previous section is key for finding the candidates' equilibrium proposals: Lemma 1 shows the media outlet's equilibrium reporting rule and thus pins down the candidates' probability of electoral victory given any pair of policies q.

I denote by $q_i^*(k)$ the equilibrium policy advanced by the incumbent and by $q_c^*(q_i, k)$ the challenger's best response to some proposal q_i. I refer to policies that are relatively close to the voter's bliss φ_v as "popular" and to policies that are relatively close to the outlet's bliss φ_m as "biased." The next result concerns the ideological media case.

Proposition 1 *The equilibrium policy outcomes in the game with an ideological media are such that,*

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[27] There are perfect Bayesian equilibria in the communication subgame $\hat{\Gamma}$ where the outlet supports the incumbent (resp. challenger) by delivering a report that is lower (resp. higher) than the actual realization of quality. These equilibria do not survive the Intuitive Criterion test.
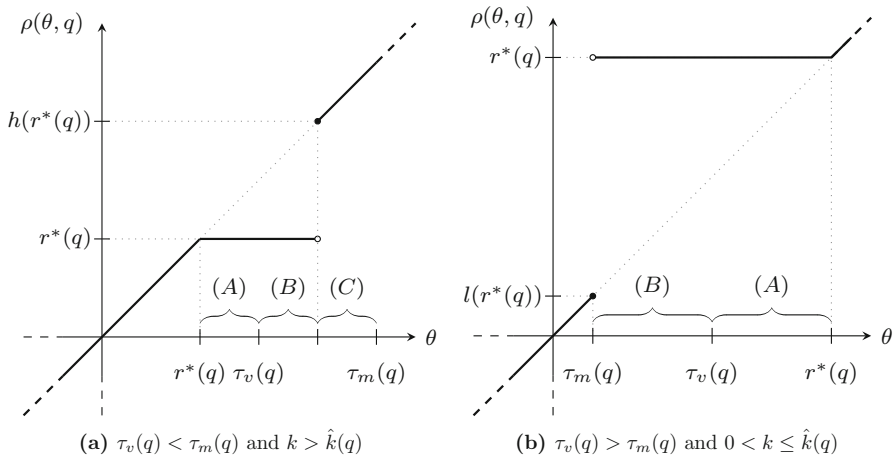
Fig. 3 The two panels illustrate the pragmatic media's equilibrium reporting rule for different levels of misreporting costs and ordering of policy proposals. The states in which the outlet misreports even though there is no interim conflict of interest are marked by (A). The states in which persuasion occurs are marked by (B). The states in which the outlet reveals the true realization of quality even though there is a conflict of interest are marked by (C). In all other states there is no conflict of interest, and truthful revelation always occurs

(i) *There exists a finite* $\tilde{k} > 0$ *such that* $q_i^*(k) \neq q_c^*(q_i^*(k), k)$ *for every finite* $k \geq \tilde{k}$,
(ii) $\lim_{k \to 0^+} q^*(k) = (\varphi_m, \varphi_m)$,
(iii) $\lim_{k \to \infty} q^*(k) = (\varphi_v, \varphi_v)$.

Proposition 1 shows that, when the media outlet is ideological, the equilibrium policy outcomes converge for extreme misreporting costs levels, whereas they differ for intermediate costs. In particular, the equilibrium policies converge to the media outlet's bliss φ_m as costs k shrink to zero. Intuitively, both candidates seek the support of extremely influential media by proposing the media's preferred policy. Differently, the equilibrium policies converge to the voter's bliss φ_v as costs k get infinitely large. In this case, misreporting is prohibitively expensive. The candidates can get no benefit from pleasing a truthful media, and would rather seek to please the voter with her ideal policy.

The next proposition shows that the above result carry through when the media outlet is pragmatic. In this case, it is possible to obtain a closed-form solution for the equilibrium policy outcomes. Proposition 2 establishes the proposals $q^*(k) = (q_i^*(k), q_c^*(q_i^*(k), k))$ as a function of the misreporting costs' intensity k.

Proposition 2 *In the game with a pragmatic media, the equilibrium policy outcomes are*

$$q_i^*(k) = \begin{cases} \varphi_v + \dfrac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)} - \sqrt[4]{\dfrac{\hat{\xi}}{\gamma^2 k}} & \text{if } k > \bar{k} \\ \dfrac{\varphi_v + \varphi_m}{2} - \dfrac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)} & \text{if } k \in (\bar{k}/4, \bar{k}] \\ \varphi_m & \text{if } k \in (0, \bar{k}/4], \end{cases}$$
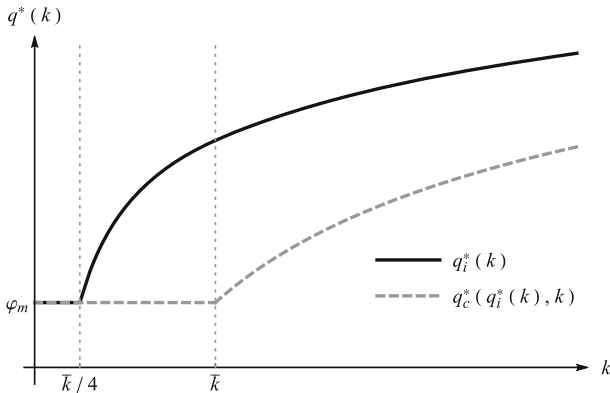
Fig. 4 Equilibrium policy outcomes in the game with a pragmatic media. As the misreporting costs k grows arbitrarily large, both proposals monotonically converge to φ_v

$$q_c^*(q_i^*(k), k) = \begin{cases} \varphi_v - \sqrt[4]{\dfrac{\hat{\xi}}{\gamma^2 k}} & \text{if } k > \bar{k} \\ \varphi_m & \text{if } k \in (0, \bar{k}]. \end{cases}$$

where $\bar{k} = \hat{\xi} / [\gamma^2(\varphi_v - \varphi_m)^4]$.

When the media is pragmatic, equilibrium proposals are weakly increasing in k and strictly increasing for every finite[28] $k > \bar{k}$. When the costs of misreporting information are relatively low, i.e. for $k \in (0, \bar{k}/4]$, both candidates advance the media outlet's bliss policy φ_m. Thus, variations of k within the region $(0, \bar{k}/4]$ leave the equilibrium policies unaltered. For intermediate costs, $k \in (\bar{k}/4, \bar{k}]$, the incumbent proposes increasingly moderate policies $q_i^*(k) \in (\varphi_m, \frac{\varphi_v + \varphi_m}{2})$, while the challenger keeps offering the outlet's bliss φ_m. Thus, an increase of k in the region $(\bar{k}/4, \bar{k})$ generates policy divergence. When the costs of misreporting are relatively high, $k > \bar{k}$, the challenger proposes less biased policies as well. As k grows arbitrarily large, both proposals converge to the voter's preferred policy φ_v, with $q_i^*(k) > q_c^*(q_i^*(k), k)$ for every finite[29] $k > \bar{k}/4$. Figure 4 illustrates the equilibrium policy proposals for different levels of misreporting costs' intensity k.

Hereafter, I discuss the intuition behind Proposition 2. Since policies outside the set $[\varphi_m, \varphi_v]$ are always dominated, I restrict attention[30] to $q_j \in [\varphi_m, \varphi_v]$, $j \in \{i, c\}$.

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[28] The threshold $\bar{k}$ is the highest intensity of misreporting costs such that the challenger best responds with φ_m when undercutting the incumbent's proposal. See the end of Appendix A.2.1 for a formal derivation that $q_i^*(k)$ is strictly increasing in k for $k > \bar{k}$.

[29] Equilibrium proposals are continuous in k as $\lim_{k \to \bar{k}+} q_i^*(k) = \lim_{k \to \bar{k}-} q_i^*(k)$ and $\lim_{k \to \bar{k}/4} q_i^*(k) = \lim_{k \to \bar{k}/4} q_c^*(q_i^*(k), k) = \varphi_m$.

[30] The focus on policies in the set $[\varphi_m, \varphi_v]$ is without loss of generality: for both candidates $j \in \{i, c\}$, proposals $q_j > \varphi_v$ (resp. $q_j < \varphi_m$) are dominated by every $q_j' \in [\varphi_v, q_j)$ (resp. $q_j' \in (q_j, \varphi_m]$) as any such q_j' is more appealing to both the voter and the outlet.

First, consider the challenger's problem of best responding to the incumbent's proposal. When the incumbent proposes a relatively popular policy, the challenger's best response is to "undercut" the incumbent with the most biased policy $q_c < q_i$ that endows the media outlet with fully persuasive power.[31] With this strategy, the challenger maximizes both the extent of the conflict of interest $(\tau_m(q), \tau_v(q))$ and the probability of receiving the outlet's support, subject to the outlet exerting full persuasion. Even though the challenger's best response is less appealing to the voter, the loss in "popular appeal" is more than compensated by the outlet's ability to persuade the voter over a large set of contingencies. By contrast, offering a more popular policy $q_c > q_i$ would make the challenger slightly more appealing to the voter at the expense of getting the incumbent into the good graces of a fully persuasive media outlet. Thus, offering any $q_c > q_i$ is suboptimal in this case.

When the incumbent proposes relatively biased policies and misreporting costs are sufficiently high, the best response of the challenger is to offer the voter's bliss φ_v. This strategy generates a large conflict of interest $\hat{\Theta}(q) = (\tau_m(q), \tau_v(q))$ such that the voter requires evidence that quality is exceptionally high in order to vote for the incumbent. The outlet is now more likely to support the incumbent than the challenger but, because of high misreporting costs and a sharp policy divergence, it cannot exert full persuasion. In this case, offering the voter's bliss φ_v is the challenger's best response because it leaves the incumbent with an unpopular policy and the support of a weakened media outlet.

Similarly, when the incumbent's policy is relatively biased but misreporting costs are sufficiently low, the challenger's best response remains that of undercutting the incumbent. The strategy of proposing the voter's bliss now backfires because with a low intensity of misreporting costs the media outlet retains its ability to persuade the voter in a relatively large share of $\hat{\Theta}(q)$. If the costs' intensity k is low enough, then the challenger's best response is to undercut the proposal of the incumbent to the point of offering the outlet's bliss φ_m. Figure 5 shows the challenger's best response for different intensities of misreporting costs.[32]

Consider now the incumbent's problem of selecting a policy that maximizes her probability of electoral victory, and suppose first that the intensity of misreporting costs is relatively high, $k > \bar{k}/4$. In this case, the optimal proposal of the incumbent $q_i^*(k)$ is the policy that makes the challenger indifferent whether to best reply with the voter's bliss or with a relatively more biased policy (i.e., by undercutting the incumbent): higher proposals $q_i > q_i^*(k)$ would allow the challenger to get the support of a fully persuasive outlet; lower proposals $q_i < q_i^*(k)$ would be highly unpopular in comparison with the challenger's best response of offering the voter's bliss. By contrast, when the intensity of misreporting costs is relatively low, $k \in (0, \bar{k}/4)$, the media outlet exerts full persuasion for any combination of candidates' proposals $q \in [\varphi_m, \varphi_v]^2$. In this case, the incumbent's optimal policy is to offer the outlet's bliss,

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[31] Formally, the challenger offers the lowest proposal that satisfies condition (3) with equality.

[32] Proposition A.2 in Appendix A.2.1 shows the challenger's best response function.

Fig. 5 The challenger's best response in the game with a pragmatic media outlet. The best response is depicted in black for relatively high costs, $k > \bar{k}$; in dashed light gray for intermediate costs, $k \in (\bar{k}/4, \bar{k})$; in dark gray, for relatively low costs, $k \in (0, \bar{k}/4]$
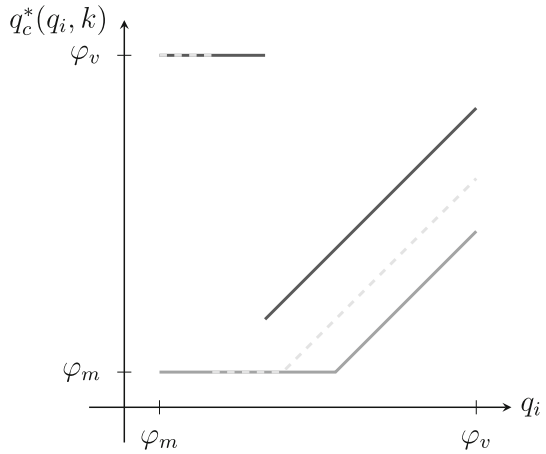
as any higher proposal $q_i > \varphi_m$ would allow the challenger to get the support of a fully persuasive media outlet by undercutting[33] q_i.

The presence of a persuasive media outlet generates a distortion in the process of policy-making. Since candidates look to gain the influential outlet's support, their proposals drift away from the voter's preferred policy, breaking down the centripetal force of the median voter theorem (Black 1948; Downs 1957). This distortion peaks when the intensity of misreporting costs is sufficiently low so that both candidates advance the media outlet's bliss policy. In this case, persuasion never takes place since there is no conflict of interest when candidates' proposals are identical (see Lemma 1). Therefore, with lower (resp. higher) intensities of misreporting costs the voter might have worse (resp. better) policies but more (resp. less) information about quality. In the next section, I study this trade-off in relation to the voter's welfare.

5 Voter's welfare and information

Having characterized the equilibrium of the communication subgame (Lemma 1 in Sect. 4.1) and the candidates' equilibrium proposals (Propositions 1 and 2 in Sect. 4.2), I now proceed to study the welfare implications of variations in costs k. I denote by $W_v^*(k)$ the voter's equilibrium expected utility and refer to $W_v^*(k)$ simply as the voter's welfare.[34] As a benchmark, consider the voter's expected utility under complete information, which I denote by $\hat{W}_v$. Suppose that the voter perfectly observes the realized quality after the policy-making stage but before the election takes place. In this case, both candidates cannot do better than offer the voter's bliss policy as

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[33] Notice that the model does not predict that the incumbent always takes a more popular position than the challenger. While this happens in the sender-preferred equilibrium, there are other equilibria where the challenger goes fully popular by offering the voter's favorite policy and the incumbent proposes a relatively more biased policy. See Proposition A.2.

[34] All formal proofs of the results in this section are relegated to Appendix A.3. See Eq. (6) in Appendix A.3 for an explicit formulation of $W_v^*(k)$ for the pragmatic media case.

the media outlet would have no role. The candidate with the highest relative quality is always elected, and the voter's favorite policy is always implemented. Therefore, $\hat{W}_v = \phi/4$.

As we have seen in the previous section, the process of policy-making is strategically intertwined with the voter's informational environment. Interventions that change the misreporting costs might affect both the amount of information received by the voter and the policies advanced by the candidates.[35] Policy proposals affect the media's incentive to misreport, and indirectly determines how much information the voter eventually obtains from the media's report. To understand how changes in costs k affect the voter's information, I look at how frequently persuasion takes place on the equilibrium path. Denote by $\chi(k)$ the ex-ante probability that persuasion occurs in equilibrium. I hereafter refer to χ as the *persuasion rate*. The next result, concerning the ideological media case, uncovers a non-monotonic relationship between the voter's welfare and information.

Proposition 3 *In the game with an ideological media, the voter's equilibrium welfare $W_v^*(k)$ and the equilibrium persuasion rate $\chi(k)$ are such that*

(i) $\lim_{k \to 0^+} W_v^*(k) = \phi/4 - \gamma(\varphi_v - \varphi_m)^2 < \lim_{k \to \infty} W_v^*(k) = \hat{W}_v = \phi/4$,
(ii) $\lim_{k \to \infty} \chi(k) = \lim_{k \to 0^+} \chi(k) = 0$,
(iii) *There exists a finite $\tilde{k} > 0$ such that $W_v^*(k') > \lim_{k \to 0^+} W_v^*(k)$ and $\chi(k') > 0$ for every finite $k' \geq \tilde{k}$. The equilibrium persuasion rate $\chi(k)$ is continuous in k.*

Proposition 3 shows that the voter is well informed when the costs k are extremely high or extremely low. In these cases, misreporting and persuasion never take place. As a result, the voter always selects her preferred candidate. However, perfect selection comes at a welfare loss when costs k shrink to zero. Proposition 1 shows that this loss is due to a policy distortion that is absent when costs k are infinitely high. Persuasion occurs with positive probability at intermediate levels of costs k. In these cases, the voter sometimes elects the wrong candidate because she is persuaded by the media to do so. Imperfect selection comes at a cost in terms of welfare. However, the voter can still be better off with intermediate costs than when k is extremely small: the welfare gains from having better policies may dominate the loss from electing worse candidates.

To sum up, when the media outlet is ideological, interventions that increase the misreporting costs can generate more disinformation, and yet make the voter better off. Persuasion can be fully eliminated by setting extremely low costs, but doing so would yield large policy distortion that are detrimental to the voter's welfare. The next proposition shows that these qualitative results carry through when the media is pragmatic.

Proposition 4 *In the game with a pragmatic media, the voter's equilibrium welfare $W_v^*(k)$ and the equilibrium persuasion rate $\chi(k)$ are such that*

(i) $W_v^*(k) = \phi/4 - \gamma(\varphi_v - \varphi_m)^2$ *for all $k \in (0, \bar{k}/4)$,*

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[35] The voter receives more (resp. less) information if, given the outlet's reporting rule ρ, she casts a ballot for her preferred candidate in more (resp. less) states.

(ii) $W_v^*(k)$ is strictly increasing in k for all finite $k \geq \bar{k}/4$, with $W_v^*(k) \to \hat{W}_v$ as $k \to \infty$,

(iii) $\chi(k) = 0$ for all $k \in (0, \bar{k}/4)$, whereas $\chi(k') > 0$ for all finite $k' > \bar{k}/4$. Moreover, $d\chi(k'')/dk'' > 0 > d\chi(k''')/dk'''$ for all $k'' \in (\bar{k}/4, \bar{k})$ and $k''' > \bar{k}$, and $\lim_{k\to\infty} \chi(k) = 0$.

When the outlet is pragmatic, we still obtain that increments in costs k can make the voter less informed and yet better off. Moreover, we obtain two additional and important results in the pragmatic media case. First, the voter's welfare is unresponsive to changes in misreporting costs when k is already sufficiently low. Second, the voter's welfare is weakly increasing in k, and strictly increasing for sufficiently high levels of k.

Before discussing the intuition behind Proposition 4, it is useful to remark some important features of the equilibria in Proposition 2 and Lemma 1. First, equilibrium policies $q^*(k)$ satisfy condition (3) for every finite k: on the equilibrium path, the media outlet always exerts full persuasion and the candidate preferred by the outlet, $\hat{m}(q^*(k), \theta)$, is always elected. Figure 6 shows the pragmatic outlet's reporting rule on the equilibrium path for some finite $k > \bar{k}/4$. Second, an increase in the misreporting costs' intensity does not necessarily yield more information to the voter. Intuitively, since the outlet exerts full persuasion, the larger the conflict of interest $\hat{\Theta}(q^*(k))$, the less the information received by the voter. Recall that the share of states in which there is a conflict of interest is directly proportional to the difference between proposals.[36] It follows that an increase in k yields more (resp. less) information to the voter only if it generates policy convergence (resp. divergence). However, Proposition 2 shows that the distance between equilibrium proposals is non-monotonic[37] in k. Hence, an increase in the misreporting costs might decrease the amount of information received by the voter in equilibrium. Third, with a relatively low intensity of misreporting costs, i.e., $k \in (0, \bar{k}/4)$, there is no conflict of interest because equilibrium policies are identical. In this case, persuasion never occurs and the media outlet fully reveals its private information about quality. By contrast, persuasion always takes place with positive probability for every finite $k > \bar{k}/4$. In equilibrium, there is persuasion only if misreporting costs are sufficiently high.

Since an increase in the misreporting costs might yield the voter better policies at the expense of selecting the best candidate with lower probability, it is not clear how this type of intervention would affect the voter's welfare. Proposition 4 shows that, even in those cases where an increase in k generates more persuasion, the gain that the voter obtains from having better policies always overcomes the expected loss in quality due to worse selection. From Proposition 2 and Lemma 1, we have that on the equilibrium path the persuasion rate in the pragmatic media case is $\chi(k) = \frac{1}{2\phi}(\tau_m(q^*(k)) - \tau_v(q^*(k)))$. As observed before, the media outlet is more likely to persuade the voter when the set of states in which there is a conflict of interest $\hat{\Theta}(q^*(k))$ is larger. Figure 7 shows both the voter's welfare and the probability that persuasion occurs as a function of k.

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[36] Formally, $|\hat{\Theta}(q^*(k))| = 2\gamma(\varphi_v - \varphi_m)(q_i^*(k) - q_c^*(q_i^*(k), k))$.

[37] A marginal increment in k generates policy convergence for all finite $k > \bar{k}$, policy divergence for all $k \in (\bar{k}/4, \bar{k})$, and has no effect on policies for all $k \in (0, \bar{k}/4)$.

Fig. 6 The pragmatic media outlet's reporting rule on the equilibrium path for some finite $k > \bar{k}/4$. The outlet exerts full persuasion and its preferred candidate is always elected
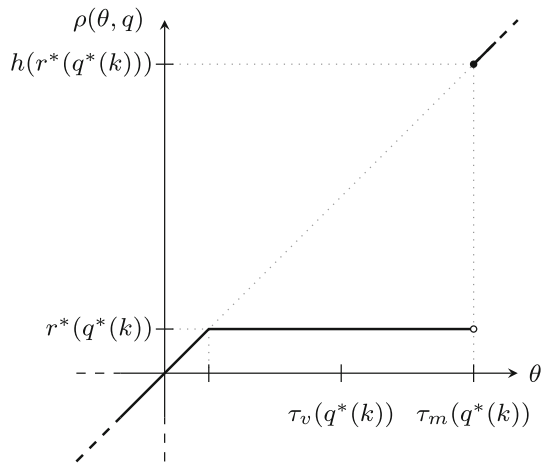
The policy/information trade-off occurs when $k \in [\bar{k}/4, \bar{k})$: in this case, a marginal increase in the costs' intensity k generates policy divergence, more disagreement, and thus a higher persuasion rate $\chi(k)$. As a consequence, the voter becomes increasingly likely to cast a ballot for the wrong candidate. The expected loss in quality due to worse selection is more than compensated by the availability of an increasingly popular policy advanced by the incumbent: since the proposals of both candidates are heavily skewed toward the media outlet's preferred policy, the voter obtains an exceptionally high gain from policies that, on average, are closer to her bliss. When $k \geq \bar{k}$, an increase in the costs' intensity generates proposals that are both more popular and closer to each other. The resulting policy convergence reduces the conflict of interest, and thus the persuasion rate $\chi(k)$ declines. In this case, the welfare of the voter increases because she obtains better policies and makes a better selection of candidates. By contrast, when $k \in (0, \bar{k}/4)$, a marginal increase in the costs' intensity has no effect on equilibrium policies and thus does not impact the voter's welfare either. As a result, lenient measures can actually decrease the voter's welfare when taking into consideration the public resources required to carry out the interventions.

6 Applications and extensions

6.1 Media bans

As we have seen in the previous section, the media outlet provides the voter with useful information about candidates' quality, but on the other hand it generates a policy distortion where proposals drift away from the voter's bliss. This trade-off reaches its peak when the intensity of misreporting costs is relatively low: the media outlet fully reveals its private information about quality but the proposals of both candidates collapse to the outlet's preferred policy. If the quality of the elected candidate is of little importance with respect to the implemented policy, then the voter might be better off without the media outlet: in this case, both candidates would pander to the uninformed
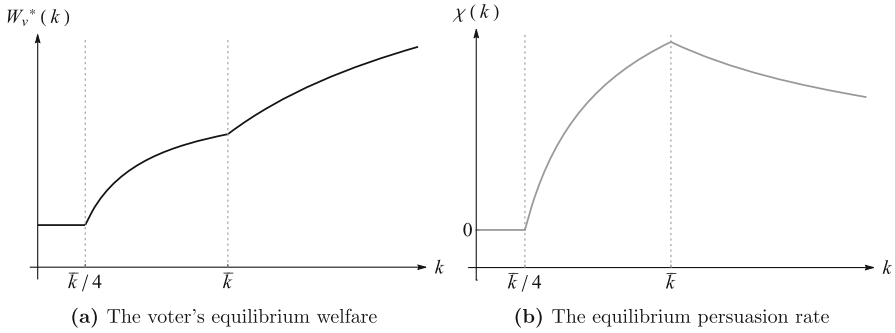
(a) The voter's equilibrium welfare   **(b)** The equilibrium persuasion rate

Fig. 7 The figures depict the equilibrium voter's welfare and persuasion rate in the game with a pragmatic media. The voter's welfare increases with the intensity of misreporting costs even when higher costs' intensities lead to a higher persuasion rate. With relatively low intensities of misreporting costs there is no persuasion but the voter's welfare is at its minimum. As k grows arbitrarily large, $W_v^*(k)$ and $\chi(k)$ converge monotonically to $\hat{W}_v = \phi/4$ and zero, respectively

voter by offering her preferred policy, and the voter would randomly cast a ballot for one of the two candidates. The next result applies to both the ideological and pragmatic media cases, and it shows conditions under which the voter is better off without the media outlet.

Corollary 1 *If* $-\gamma(\varphi_v - \varphi_m)^2 + \phi/4 < 0$, *then there exists a finite* $k' > \bar{k}/4$ *such that the voter is strictly better off without media outlet for all* $k \in (0, k')$.

Alternatively, the voter might be better off with a "media ban" that forbids the delivery of policy-relevant news in the run-up to the election. Conditional on the intensity of misreporting costs being low enough, the voter is better off without the media outlet if: (i) γ is high enough, so that policies are much more important than quality; (ii) the preferred policy of the voter and the media outlet are different enough; i.e., there is a large ideological difference $|\varphi_v - \varphi_m|$; (iii) ϕ is small enough; that is, quality has little impact on which candidate is best. By contrast, if the costs' intensity is high enough, then the presence of the media outlet always benefits the voter. Corollary 1 is complementary to the similar findings of Chakraborty and Ghosh (2016) in a cheap talk setting, Alonso and Camara (2016) in a Bayesian persuasion framework, and Boleslavsky and Cotton (2015) for a non-strategic and exogenous media outlet.

6.2 Endogenous regulation

In the previous section, Propositions 3 and 4 suggest that a regulator concerned about the voter's welfare should implement an intensity of misreporting costs that is as high as possible. However, regulation is often performed by actors that are neither fully detached from the political process nor have interests that are perfectly aligned with those of voters. In fact, "fake news laws" are mostly promulgated and discussed in parliaments where the incumbent government has substantial decisive and legislative

power.[38] I first discuss the case where the incumbent candidate selects the intensity of misreporting costs.

Consider the following extension of the main model: ahead of the policy-making stage, the incumbent sets costs' intensity $k_i > 0$, which is publicly observed and cannot be changed in the short run. Then, the game proceeds as described in Sect. 3. The incumbent, being purely office-seeking, selects k_i to maximize her chances of electoral victory. I denote by $\iota(k)$ the incumbent's equilibrium winning probability, and by k_i^* the costs' intensity that maximizes $\iota(k)$. The next result shows that the incumbent candidate would select a costs' intensity that is relatively low.

Lemma 2 *The incumbent sets* $k_i^* = 0$ *in the game with an ideological media, and* $k_i^* \in \left[0, \bar{k}/4\right]$ *in the game with a pragmatic media, where* $\iota\left(k_i^*\right) = \frac{1}{2} = \lim_{k \to \infty} \iota(k)$.

To see the intuition behind this result, recall that the sequential nature of the policy-making process allows the challenger to offer policies that are more appealing to the media outlet relative to those offered by the incumbent (see Sect. 4.2). By obtaining the outlet's support, the challenger enjoys a second-mover advantage as she becomes more likely to be elected than the incumbent.[39] Fig. 8 shows that, in the pragmatic media case, the incumbent's probability of electoral victory is less than a half for all finite $k > \bar{k}/4$. Lemma 2 shows that, when in charge of regulation, the incumbent eliminates the challenger's second-mover advantage by setting relatively low misreporting costs to force policy-convergence: when candidates advance the same policy, the media outlet never engages in misreporting, and thus the challenger cannot benefit from the outlet's support. Higher intensities of misreporting costs would generate policy divergence and thus a conflict of interest that would benefit the challenger at the expense of the incumbent's probability of electoral victory.

Lemma 2 casts a negative light on the process of regulation. From the voter's viewpoint, the incumbent could not select a worse costs' intensity: even though k_i^* is such that misreporting and persuasion never take place, the induced policy distortion is maximized and the voter's welfare is at its minimum. The resulting outcome is *as if* the media outlet could directly decide upon which candidate gets elected and which policy is implemented. Moreover, for such a low intensity of misreporting costs k_i^* the voter might be better off without the media outlet at all (Corollary 1). The situation is better, but still far from ideal, when the challenger is in charge of selecting the costs' intensity: in this case, the challenger maximizes her chances of electoral victory by selecting $k_c^* = \arg \min_{k \in \mathbb{R}_+} \iota(k)$. This intermediate level of costs' intensity generates policy divergence and thus a positive persuasion rate $\chi(k)$. However, the voter may be better off with k_c^* than with k_i^* because of a reduction in policy distortion. As long as candidates have an influence over the regulatory process, their office-seeking motivation results in a pull for implementing costs' intensities that are suboptimal from the voter's standpoint.

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[38] Funke and Famini (2018) provide a comprehensive list of measures recently taken by governments against online misinformation.

[39] The incumbency disadvantage effect that is behind the result in Lemma 2 is present also in equilibria that are non-sender-preferred. By definition, $\iota(k)$ is the same even when the challenger does not break indifference in favor of the media outlet.
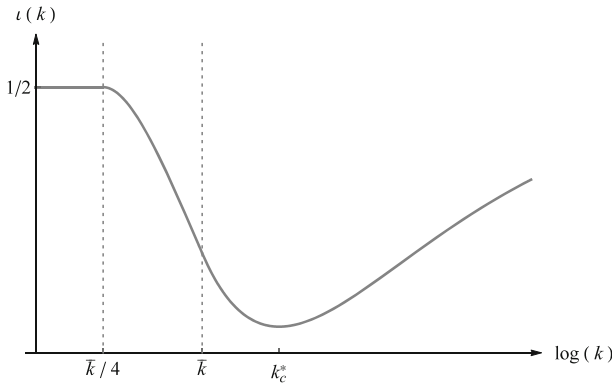
Fig. 8 The incumbent's probability of electoral victory, $\iota(k)$, as a function of the costs' intensity k in the game with a pragmatic media. As the intensity of misreporting costs grows arbitrarily large, $\iota(k)$ monotonically converges to $1/2$

An additional implication of Lemma 2 is that media bans (Sect. 6.1) can be an alternative regulation method. The incumbent politician may promote a media ban because, similarly to a cost reduction, it would force policy convergence. When the condition outlined in Corollary 1 is satisfied, the voter would prefer a media ban over a cost reduction to k_i^*. By contrast, challengers would advocate against media bans to preserve their second-mover advantage.[40]

We have seen that the sequential nature of policy-making is key for Lemma 2. By contrast, regulation is not necessarily be suboptimal under simultaneous policy-making.[41] Other model specifications do not affect the result in Lemma 2. For example, extensions in Sect. 6.3 show that the baseline model's equilibria are not affected by the presence of multiple media or by allowing for more general communication strategies, including vague reports and information withholding. In addition, regulation would remain suboptimal even when modeled as a bargaining process between the incumbent and the challenger. In this case, the resulting cost intensity would stand between k_i^* and k_c^*, both of which are suboptimal. Therefore, the result in Lemma 2 is robust to several model extensions.

6.3 Extensions

This section considers several extensions of the baseline model to examine the robustness of the results. Formal proofs are relegated to the Supplementary Appendix B.

Multiple media outlets A monopoly best describes cases in which media outlets can have exclusive possession of policy-relevant news. Therefore, the analysis of a monop-

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[40] A full-fledged model of endogenous regulation should also account for the cost of performing interventions, including variations of costs k and media bans. Here, I deliberately chose to abstract from regulation costs because the results would be highly dependent on the assumed cost structure.

[41] Consider a variant of the main model where policy-making is simultaneous. Symmetric equilibria exist, where the candidates have the same ex-ante winning probability. In these equilibria, the party in charge of regulation is indifferent between different levels of k, and thus it may set costs as high as possible.

olistic news market is an important and natural first step to understanding interventions that affect misreporting costs. As follows, I show that all results obtained in the baseline model carry through even when there is more than one informed outlet.

Consider a variant of the baseline model where there are $n > 1$ informed media outlets in the set $M = \{1, 2, \ldots, n\}$. A report by outlet j is r_j. Each $j \in M$ has a bliss policy $\varphi_j < \varphi_v$. Therefore, senders are "like biased."[42] The preferred candidate of outlet j is $\hat{m}_j(\theta, q) = i$ if $\theta > \tau_j(q)$ and $\hat{m}_j(\theta, q) = c$ otherwise, where $\tau_j(q) = \gamma(2\varphi_j - q_c - q_i)(q_c - q_i)$. Outlet j obtains a payoff of $u_j(r_j, b, \theta, q) = \mathbb{1}\{b = \hat{m}_j(\theta, q)\}\xi_j(\theta, q) - k(r_j - \theta)^2$ when reporting r_j in state θ. I denote the profile of reports by $\{r_j\}_M$, and the voter's posterior beliefs by $p_M(\theta \,|\, \{r_j\}_M, q)$. The "highest misreporting type" of outlet j, denoted by $h_j(r_j)$, is defined as in Eq. (2). I denote with $\hat{\Gamma}_M$ the communication subgame of this multi-sender variant of the baseline model. The rest of the model remains as before,[43]

I define the "least biased" media outlet as the outlet that, by itself, would achieve persuasion less often. Specifically, the least biased outlet $\ell \in M$ has $|r_\ell^*(q) - \tau_v(q)| \leq |r_j^*(q) - \tau_v(q)|$ for every $j \in M$, where the pooling report $r_i^*(q)$ is defined as in Lemma 1. There exists an equilibrium of $\hat{\Gamma}_M$ where all media outlets report in the same way as the least biased outlet would do in a monopolistic news market.

Corollary 2 *Suppose that $\tau_v(q) < \tau_j(q)$ for all $j \in M$. Then, there exists an equilibrium of the communication subgame $\hat{\Gamma}_M$ where, for every $j \in M$,*

$$\rho_j(\theta, q) = \begin{cases} r_\ell^*(q) = \left\{ r \in \Theta \,|\, \mathbb{E}_f\left[\theta \,|\, \theta \in (r, h_\ell(r))\right] = \tau_v(q) \right\} & \text{if } \theta \in \left(r_\ell^*(q), h_\ell(r_\ell^*(q))\right) \\ \theta & \text{otherwise.} \end{cases}$$

Posterior beliefs $p_M(\theta \,|\, \{r_j\}_M, q)$ are according to Bayes' rule whenever possible and such that $\mathbb{E}_{p_M}[\theta \,|\, q, \{r_\ell^*(q)\}_M] = \tau_v(q)$, $\mathbb{E}_{p_M}[\theta \,|\, q, \{r_j\}_M] > \tau_v(q)$ if $r_i > r_\ell^*(q)$ for some $i \in M$, and $\mathbb{E}_{p_M}[\theta \,|\, q, \{r_j\}_M] \leq \tau_v(q)$ if $r_j \leq r_\ell^*(q)$ for all $j \in M$. As a result, $\beta(r, q) = c$ iff $r_j \leq r^*(q)$ for every $j \in M$.

In this equilibrium, all media outlets belittle the realized quality in the same way. The media's reporting strategy is pinned down by the least biased outlet's characteristics.[44] More biased outlets may want to misreport in more states, but they cannot profitably do so because the voter can always cross-validate their reports with that of the least biased outlet ℓ. Since the least biased outlet is key for persuasion, the candidates will seek

[42] Even though the media outlets are all biased in the same direction with respect to the voter, there are states in which they may prefer different candidates. In these cases, the outlets compete against each other. I study the case where outlets have "opposed biases" in Vaccari (2021).

[43] For the pragmatic media case, we have $\xi_j(\theta, q) = \xi_j > 0$, the highest misreporting type is $h_j(r_j) = \min\left\{r_j + \sqrt{\xi_j/k}\,\tau_j(q)\right\}$, and the pooling report is $r_i^*(q) = \max\left\{\tau_v(q) - \frac{1}{2}\sqrt{\xi_i/k}, 2\tau_v(q) - \tau_i(q)\right\}$ if $\tau_v(q) < \tau_i(q)$, and $r_i^*(q) = \min\left\{\tau_v(q) + \frac{1}{2}\sqrt{\xi_i/k}, 2\tau_v(q) - \tau_i(q)\right\}$ if $\tau_v(q) > \tau_i(q)$.

[44] Corollary 2 shows that equilibrium communication is essentially driven by the least biased outlet. In a cheap talk model, Krishna and Morgan (2001) find a similar result. There are other equilibria with multiple outlets. Notably, there are fully revealing equilibria in truthful strategies where $\rho_j(\theta, q) = \theta$ for every $\theta \in \Theta$, $q \in \mathbb{R}^2$, and $j \in M$. These equilibria are not robust to outlets' collusion, that is, to non-binding pre-play communication. For a formal proof, see Vaccari (2021).

for its support when proposing their polices. Importantly, they would never propose policies that are lower than ℓ's bliss φ_ℓ, for doing so would make them lose the support of both the voter and the least biased outlet at the same time. Given the equilibrium of the communication subgame described by Corollary 2, candidates face incentives that are similar to those studied for the monopolistic media case in Sect. 4.2. As a consequence, we can apply the results from Propositions 1 and 2 to this multi-sender variant of the game by setting $\varphi_m = \varphi_\ell$. It follows that all the results obtained from the baseline model with a single media extend to the multiple media case considered here.

Simultaneous policy-making In the main model, I assume that candidates propose policies sequentially. The sequential nature of the policy-making process is important as it shows that the challenger enjoys a second-mover advantage. As a result, the incumbent can use regulation to eliminate the challenger's advantage at the expense of the voter. However, most qualitative results hold even when candidates propose their policies simultaneously and the media is pragmatic. In Lemma B.3, I show that in this case policy convergence to (φ_m, φ_m) occurs when $k \leq \bar{k}/4$, exactly as in the case where policy-making is sequential. For intermediate values of k, the equilibrium of the policy-making stage must be in mixed strategies (see Lemma B.4). This implies that for intermediate k policy divergence occurs with positive probability.[45] Finally, for $k \rightarrow +\infty$ we still obtain convergence to (φ_v, φ_v). Therefore, the main qualitative results about policy distortions and the rate of persuasion hold even when candidates propose their policies simultaneously rather than sequentially.

Equilibrium selection Conditions that ensure equilibrium uniqueness are important to perform exercises of comparative statics. However, as it is typical in communication games, here there are multiple equilibria. In this paper, I mainly focus on the perfect Bayesian equilibrium that is robust to the Intuitive Criterion and preferred by the sender. There are several reasons why this is a sensible choice: first, the sender-preferred equilibrium constitutes also the voter's worse case scenario, which is key for the robust approach to policy analysis (Hansen and Sargent 2008); second, it is also the unique perfect sequential equilibrium (Grossman and Perry 1986); third, among the perfect Bayesian equilibria that survive the Intuitive Criterion, the sender-preferred is the only one that is undefeated (Mailath et al. 1993)[46]; finally, the equilibrium in Lemma 1 is "intuitive" (Cho and Kreps 1987). The analysis is centered on a focal and important equilibrium that possesses a number of appealing qualities. In addition, the results about welfare would carry through even if we were to consider the whole class of perfect Bayesian equilibria that survive the Intuitive Criterion, and focus on the sets of equilibrium payoffs.[47] In Appendix A.1, I find all the perfect Bayesian equilibria of the communication subgame that survive the Intuitive Criterion (Proposition A.1).

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[45] In a similar setting with simultaneous policy proposals and cheap talk communication, Chakraborty and Ghosh (2016) characterize the candidates' mixed-strategy equilibrium for different levels of conflict of interest between the media outlet and the voter.

[46] See Lemmata B.1 and B.2 in Appendix B.

[47] To see this, notice that the multiplicity of PBE in the communication subgame (Proposition A.1 in Appendix A.1) yields a convex set $\mathcal{W}(k)$ of payoffs that the voter can obtain in equilibrium (Corollary B.1 in Appendix B.2). Since changes in the intensity of misreporting costs k affect only the lower bound of $\mathcal{W}(k)$, the focus on the voter's worst-case scenario is without loss of generality.

Withholding information The baseline model does not allow the media outlet to withhold its private information. Here, I consider an extension that accommodates for this possibility in both the ideological and pragmatic media cases. Let the outlet's report space be $R = \Theta \cup \{\varnothing\}$, where $\varnothing$ denotes the act of withholding information. This act may be costly for several reasons: e.g., it may require an active act of suppression, or it may induce a reputation loss. Say that withholding information comes at a cost $kC(\varnothing, \theta) = \omega \geq 0$ for all $\theta \in \Theta$. The rest of the model remains as before. I will use the terms "silence" and "withholding information" interchangeably.

The introduction of silence does not dismiss the equilibrium of the baseline model (Sect. 4), no matter the cost ω. To see this, consider the equilibrium of the communication subgame in Lemma 1 (or in Proposition A.1), and suppose that the voter reacts skeptically to silence: when the outlet is more likely to support the incumbent (resp. the challenger) than the voter, the voter replies to silence by casting a ballot for the challenger (resp. the incumbent). That is, beliefs are such that $\beta(\varnothing, q) = c$ if $\tau_m(q) < \tau_v(q)$, and $\beta(\varnothing, q) = i$ if $\tau_m(q) > \tau_v(q)$. No matter what is the cost of withholding information, the outlet can never gain by deviating from the prescribed strategy with silence. Therefore, the results in Sects. 4 and 5 carry through this extension.

It remains important to understand whether the introduction of silence generates alternative equilibria where the media outlet withholds information to persuade the voter. To this end, I first consider the case where withholding information comes at no cost. In this case, both babbling and cheap talk equilibria are restored.[48] However, babbling equilibria fail the Intuitive Criterion test, and influential equilibria with costless silence are equivalent to the case in the baseline model where $k = 0$. Therefore, this last special case defies the paper's purpose of studying costly communication. Consider now the case where withholding information comes at a cost $\omega > 0$. I show that, no matter how small the cost ω is, there is no perfect sequential equilibrium where the outlet persuades the voter by withholding information (Lemma B.5, Supplemental Appendix B).[49] Therefore, all results carry through when the media outlet can withhold information.

Vague reports In the baseline model, the media outlet can deliver only precise reports. Hereafter, I discuss an extended version of the model where vague reports are possible.[50] Specifically, in this augmented framework the sender is allowed to report that the realized state lies in some non-empty and non-singleton closed set $T \subseteq \Theta$. Denote by $\mathcal{T}$ the set of non-empty and non-singleton closed subsets of Θ, and by μ a mapping $\mu : \mathcal{T} \times \Theta \to \Theta$ satisfying $\mu(T, \theta) \in T$. Assume that, for every vague report $r = T \in \mathcal{T}$, the associated misreporting costs are $kC(r, \theta) = kC(\mu(T, \theta), \theta)$.

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[48] In a babbling equilibrium, the outlet always delivers $\varnothing$, and the voter casts a ballot based on her prior only. In a cheap talk equilibrium where $\tau_m(q) < \tau_v(q)$, the outlet reports truthfully when $\theta \leq \tau_m(q)$, and withholds information otherwise. Silence is persuasive if $\mathbb{E}_f[\theta \mid \theta > \tau_m(q)] = (\phi + \tau_m(q))/2 \geq \tau_v(q)$, which is always satisfied given that $\phi \geq 3\gamma(\varphi_v - \varphi_m)^2$.

[49] Differently than in the baseline model, in this extension the outlet may prefer different equilibria at the interim stage. As a result, we cannot select the sender-preferred equilibrium.

[50] In this extension, I follow the approach in (Kartik 2009, Section 5.2).

The introduction of vague reports does not alter the results obtained under the baseline model. Consider the communication subgame's equilibrium obtained in the baseline model (Lemma 1), and then introduce the possibility of delivering vague reports. Extend the voter's equilibrium decision rule to every $T \in \mathcal{T}$ as follows: if $\tau_m(q) < \tau_v(q)$, then $\beta(T, q) = \beta(\inf T, q)$; if $\tau_m(q) > \tau_v(q)$, then $\beta(T, q) = \beta(\sup T, q)$. In other words, the voter reacts skeptically to vague reports. This skepticism sustains the equilibrium outcome in Lemma 1, as the media outlet would never find it profitable to deviate from the prescribed reporting strategy to deliver a vague report.

For example, consider the case where policies are such that $\tau_m(q) < \tau_v(q)$. A vague report T with $\inf T \geq r^*(q)$ yields $\beta(T, q) = \beta(r^*(q), q) = i$. Given the equilibrium in Lemma 1, we have that $C(T, \theta) \geq C(\rho(\theta, q) = \theta, \theta) = 0$ for every $\theta \geq r^*(q)$, and $C(T, \theta') \geq C(r^*(q), \theta')$ for every $\theta' < r^*(q)$. Thus, the outlet cannot profitably deviate to a vague T such that $\inf T \geq r^*(q)$. A vague report T' with $\inf T' < r^*(q)$ yields $\beta(T', q) = c$. As a result, the outlet cannot profitably deviate to T', as $kC(T', \theta) \geq 0$ for every $\theta \in \Theta$. Importantly, the voter's beliefs are consistent with the Intuitive Criterion. Consider a deviation to T' and suppose that $\beta(T', q) = i$. If $\mu(T', \theta) \geq r^*(q)$, then T' is dominated by $r^*(q)$ in every state. If $\mu(T', \theta) < r^*(q)$, then the set of states in which the outlet is willing to deviate to T' is $[l(\mu(T', \theta)), t]$ for some $t < r^*(q)$. From the condition in Lemma 1, we have that $\mathbb{E}_f[\theta \mid \theta \in (l(\mu(T', \theta)), t)] < \tau_v(q)$, yielding $\beta(T', q) = c$. Introducing vague reports does not alter the equilibrium in Lemma 1 and the subsequent analysis.

Non-influential news The baseline model assumes a relatively large state space (see Sect. 3). More specifically, $\phi \geq 3\gamma(\varphi_v - \varphi_m)^2$ is a sufficient condition ensuring the existence of the communication subgame's equilibrium as described by Lemma 1. Intuitively, a large state space allows the media outlet to deliver the pooling report through which persuasion occurs. In addition, Corollary A.1 shows that such a condition guarantees that candidates cannot gain from proposing policies that make the media outlet irrelevant. Here, I discuss the implications of removing this assumption.

First, consider the communication subgame's equilibrium in the baseline model (Lemma 1). When the state space is small enough, the pooling report $r^*(q)$ is constrained by the state space bounds. This case requires removing the assumption that, upon receiving the pooling report $r^*(q)$, the voter breaks her indifference by selecting the outlet's supported candidate. Specifically, the voter's strategy is a function $\nu : \mathbb{R}^2 \times \Theta \times \mathbb{R}^+ \rightarrow [0, 1]$, where $\nu(q, r, k)$ denotes the probability of voting for the candidate supported by the media outlet given policies q, report r, and costs k. The analysis performed by Hodler et al. (2014) shows that, by allowing for $\nu(q, r^*(q), k) < 1$, the media's equilibrium reporting rule is qualitatively similar to that described by Lemma 1.

Second, consider the policy-making stage. A small state space may allow proposals that make the media outlet irrelevant. Consider the following example. In the baseline model with a pragmatic media outlet, the incumbent proposes the outlet's favorite policies when misreporting costs are sufficiently low (i.e., when $k < \bar{k}/4$). The challenger best replies by following suit, and thus $q^* = (\varphi_m, \varphi_m)$. However, when the state space is small enough, the challenger can propose the voter's preferred policy

to get $\tau_m(\varphi_m, \varphi_v) < 0 < \phi < \tau_v(\varphi_m, \varphi_v)$. In this situation, the voter does not need to consult the media outlet to understand more about which candidate she prefers. In fact, there is no state under which the voter would prefer to elect the incumbent. As a result, the incumbent may not want to propose φ_m in the first place. Intuitively, the media outlet has a less prominent role when there is little uncertainty about the state, and this is reflected in the candidates' proposals.

7 Conclusion

This article studies the voter's welfare in relation to interventions that affect media outlets' misreporting costs. The results provide a number of policy implications. I find that the presence of an influential and biased media outlet generates both policy and informational distortions. As a result, higher misreporting costs might be associated with more persuasion and a worse selection of candidates, but they can still increase the voter's welfare because of a reduction in policy distortions. Therefore, regulatory efforts such as "fake news laws" ought not to be judged solely by their impact on misreporting behavior. This type of intervention should not be designed with the objective of reducing or eliminating disinformation: full revelation can be achieved with relatively low misreporting costs, but the induced policy distortion would damage the voter's welfare.

When the media has pragmatic motives, interventions that increase the costs of misreporting information never make the voter worse off, even when they produce more disinformation. However, lenient regulatory efforts might be futile and thus wasteful when accounting for their implementation costs. In these cases, a regulator should either do nothing or enforce substantial measures. I also provide conditions under which the voter is better off without a media outlet.

Importantly, electoral incentives skew the process of regulation as politicians strategically choose interventions to maximize their own chances of electoral victory. For purely instrumental reasons, the incumbent government deliberately pursues interventions that damage the voter's welfare. These frictions in the regulatory process persist even when the challenger is in charge of regulation.

Declarations

A Appendix

A.1 The Communication Subgame

The communication subgame $\hat{\Gamma}$ starts after the policy-making stage, where both candidates make binding commitments to policy proposals. In this section, I assume that the proposed policies $q = (q_i, q_c)$ are such that $\tau_m(q) < \tau_v(q)$. Since policies are fixed, in this section I simplify the notation by using $\tau_j \equiv \tau_j(q)$, $\rho(\theta) \equiv \rho(\theta, q)$, $p(\theta|r, q) \equiv p(\theta|r)$, $\xi(\theta, q) \equiv \xi(\theta)$, and $\beta(r) \equiv \beta(r, q)$. Recall that an ideological media has $\xi(\theta) = |\tau_m - \theta|$, whereas a pragmatic one has $\xi(\theta) = \hat{\xi} > 0$. I use the term "generic equilibrium" to denote a perfect Bayesian equilibrium of the communication subgame $\hat{\Gamma}$ that is robust to the Intuitive Criterion (Cho and Kreps 1987). A "sender-preferred equilibrium" of the communication subgame $\hat{\Gamma}$ is the generic equilibrium preferred by the media outlet, as defined in Sect. 3.

Proposition A.1 builds on Lemmata A.1 to A.5 and shows all the generic equilibria[51] of $\hat{\Gamma}$. The proofs of Proposition A.1 and of all its supporting lemmata use a full-support and continuous prior f (not necessarily uniform) and a general misreporting cost function $kC(r, \theta)$, where $k > 0$ and $C(\cdot, \cdot)$ is continuous on $\mathbb{R} \times \Theta$ with $C(r, \theta) \geq 0$ for all $r \in \mathbb{R}$ and $\theta \in \Theta$, $C(x, x) = 0$ for all $x \in \Theta$. The cost function $C(\cdot)$ satisfies $C(r, \theta) > C(r', \theta)$ if $|r - \theta| > |r' - \theta|$ for all $\theta \in \Theta$, and $C(r, \theta) > C(r, \theta')$ if $|r - \theta| > |r - \theta'|$ for all $r \in \mathbb{R}$. I redefine the functions $l(r)$ and $h(r)$ for a general cost $C(r, \theta)$ as follows: for a $r > \tau_m$, $l(r) = \max\{\tau_m, \min\{\theta \mid kC(r, \theta) = \xi(\theta)\}\}$; for a $r < \tau_m$, $h(r) = \min\{\tau_m, \max\{\theta \mid kC(r, \theta) = \xi(\theta)\}\}$.

The set of all the voter's pure strategy best responses to a report r and posterior beliefs $p(\cdot \mid r)$ such that $\int_{\theta \in T} p(\theta|r) d\theta = 1$ is defined as[52]

$$B(T, r) = \bigcup_{p: \int_T p(\theta \mid r) d\theta = 1} \arg\max_{b \in \{i, c\}} \int_{\theta \in \Theta} p(\theta \mid r) u_v(b, \theta, q) d\theta.$$

Fix an equilibrium outcome and let $u_m^*(\theta)$ denote the outlet's expected equilibrium payoff in state θ. The set of states for which delivering report r is not equilibrium-dominated for the outlet is

$$J(r) = \left\{ \theta \in \Theta \,\middle|\, u_m^*(\theta) \leq \max_{b \in B(\Theta, r)} u_m(r, b, \theta, q) \right\}.$$

---

[51] A sufficient condition on the state space for the existence of all generic equilibria in Proposition A.1 is, for proposals q such that $\tau_v(q) > \tau_m(q)$, $\phi \geq \hat{r}(\zeta)$, where $\hat{r}(\zeta)$ is defined later by Proposition A.1. In this section I assume that such a condition is always satisfied.

[52] For $T = \varnothing$, I set $B(\varnothing, r) = B(\Theta, r)$.

An equilibrium does not survive the Intuitive Criterion refinement if there exists a state $\theta' \in \Theta$ such that, for some report r', $u_m^*(\theta') < \min_{b \in B(J(r'), r')} u_m(r', b, \theta', q)$.

In Lemma A.5, I use the following notation to denote the limits of the reporting rule $\rho(\cdot)$ as θ approaches state t from, respectively, above and below: $\rho^+(t) = \lim_{\theta \to t^+} \rho(\theta)$ and $\rho^-(t) = \lim_{\theta \to t^-} \rho(\theta)$.

Lemma A.1 *In a generic equilibrium of $\hat{\Gamma}$, $\rho(\theta)$ is non-decreasing in $\theta < \tau_m$ and $\theta > \tau_m$.*

Proof Consider a generic equilibrium and suppose that there are two states $\theta'' > \theta' > \tau_m$ such that $\rho(\theta') > \rho(\theta'')$. We can rule out that $\beta(\rho(\theta')) = \beta(\rho(\theta'')) = c$, as in such case the equilibrium would prescribe $\rho(\theta') = \theta' < \theta'' = \rho(\theta'')$. If $\beta(\rho(\theta')) = \beta(\rho(\theta'')) = i$, then in at least one of the two states θ', θ'' the outlet could profitably deviate by delivering the report prescribed in the other state. Consider the case where $\beta(\rho(\theta')) = i$ (c) and $\beta(\rho(\theta'')) = c$ (i). In equilibrium, it has to be that $\rho(\theta'') = \theta''$ ($\rho(\theta') = \theta'$). Given $\rho(\theta') > \rho(\theta'') = \theta'' > \theta'$ ($\theta'' > \theta' = \rho(\theta') > \rho(\theta'')$) and $C(\rho(\theta'), \theta'') < C(\rho(\theta'), \theta')$ ($C(\rho(\theta''), \theta'') > C(\rho(\theta''), \theta')$), the outlet could profitably deviate in state θ'' (θ') by reporting $\rho(\theta')$ ($\rho(\theta'')$). A similar argument applies for any two states $\theta' < \theta'' < \tau_m$, completing the proof. $\square$

Lemma A.2 *In a generic equilibrium of $\hat{\Gamma}$, if $\rho(\theta)$ is strictly monotonic and continuous in an open interval, then $\rho(\theta) = \theta$ for all θ in such an interval.*

Proof Consider a generic equilibrium and suppose that the reporting rule $\rho(\cdot)$ is strictly increasing (decreasing) and continuous in an open interval (a, b), but $\rho(\theta) > \theta$ for some $\theta \in (a, b)$. There always exist an $\epsilon > 0$ such that the media outlet prefers the same alternative in both states θ and $\theta - \epsilon$, and $\theta < \rho(\theta - \epsilon) < \rho(\theta)$ (resp. $\rho(\theta - \epsilon) > \rho(\theta) > \theta$). The media outlet never pays misreporting costs to implement its least preferred alternative; therefore, it must be that $\beta(\rho(\theta)) = \beta(\rho(\theta - \epsilon))$. Since $C(\rho(\theta - \epsilon), \theta) < C(\rho(\theta), \theta)$ (resp. $C(\rho(\theta), \theta - \epsilon) < C(\rho(\theta - \epsilon), \theta - \epsilon)$), the media outlet has a profitable deviation in state θ (resp. $\theta - \epsilon$), contradicting that $\rho(\cdot)$ is in equilibrium. $\square$

Lemma A.3 *In a generic equilibrium of $\hat{\Gamma}$, $\rho(\theta) = \theta$ for almost every $\theta \leq \tau_m$.*

Proof Consider a generic equilibrium and suppose that $\rho(\theta) \neq \theta$ for all $\theta \in S$, where S is an open set such that $\sup S \leq \tau_m$ and $S \subset \Theta$. Beliefs must be such that $\beta(r) = i$ for all $r \in S$. Suppose that a report $r' \in S$ is off-path. It must be that $u_m^*(\theta) \geq u_m(r', i, \theta, q)$ for all $\theta \geq \tau_m$. Since $\sup J(r') \leq \tau_m < \tau_v$ and $B(J(r'), r') = c$, the outlet can profitably deviate by reporting truthfully when $\theta = r' \in S$. Hence, all reports $r \in S$ must be on-path. To have $\beta(r') = i$ for a $r' \in S$, it must be that $\rho(\theta') = r'$ for some $\theta' \geq \tau_v$. In all states $\theta > \tau_m$ such that $\rho(\theta) \in S$, the outlet must deliver the same least expensive report $r' \in S$ such that $\beta(r') = i$. Thus, S has measure zero and $\rho(\theta) = \theta$ for almost every $\theta \leq \tau_m$. $\square$

Lemma A.4 *In a generic equilibrium of $\hat{\Gamma}$, $\rho(\cdot)$ is discontinuous at some $\theta \in \Theta$.*

Proof Suppose by way of contradiction that there is a generic equilibrium where $\rho(\theta)$ is continuous in Θ. From Lemma A.3, we know that $\rho(\theta) = \theta$ for $\theta \leq \tau_m$. If $\rho(\theta) = \theta$

also for all $\theta > \tau_m$, then the equilibrium would be fully revealing. In such case, the outlet could profitably deviate by reporting τ_v when the state is $\theta \in (\tau_v - \epsilon, \tau_v)$ for some $\epsilon > 0$. Therefore, it must be that $\rho(\theta') \neq \theta'$ for some state $\theta' > \tau_m$. By Lemma A.2, it has to be that $\rho(\theta') < \theta'$, or otherwise $\rho(\cdot)$ would be discontinuous; therefore Lemmata A.1 and A.2 imply that $\rho(\theta) = \rho(\theta')$ for all $\theta \in (\max\{\rho(\theta'), \tau_m\}, \sup \Theta)$. There always exists a report $r' \geq \theta'$ such that $\inf J(r') \geq \max\{\rho(\theta'), \tau_m\}$. Since $\beta(\rho(\theta')) = i$, it must be that $B(J(r'), r') = i$. Therefore, there are states where the media outlet would have a profitable deviation, contradicting that a continuous $\rho(\cdot)$ can be part of a generic equilibrium. $\qquad \square$

Lemma A.5 *In a generic equilibrium of $\hat{\Gamma}$, $\rho(\cdot)$ has a unique discontinuity in state θ_δ, where $\theta_\delta \in [\tau_m, \tau_v]$. The reporting rule*[53] *is such that $\rho(\theta) = \rho^+(\theta_\delta) > \theta_\delta = l(\rho^+(\theta_\delta))$ for $\theta \in (\theta_\delta, \rho^+(\theta_\delta))$ and $\rho(\theta) = \theta$ for all $\theta \in (\inf \Theta, \theta_\delta) \cup [\rho^+(\theta_\delta), \sup \Theta)$.*

Proof I denote by θ_δ the lowest state in which a discontinuity of $\rho(\cdot)$ occurs. By Lemmata A.3 and A.4, we know that in equilibrium such a discontinuity exists and $\theta_\delta \geq \tau_m$.

Suppose that $\rho^-(\theta_\delta) \neq \theta_\delta$. If $\rho^-(\theta_\delta) < \theta_\delta$, then by Lemmata A.1 and A.2 we have that $\rho(\theta) = \rho^-(\theta_\delta)$ for all $\theta \in (\max\{\rho^-(\theta_\delta), \tau_m\}, \theta_\delta)$ and $\rho(\theta) = \theta$ for $\theta \leq \max\{\rho^-(\theta_\delta), \tau_m\}$. In equilibrium, it has to be that $\beta(\rho^-(\theta_\delta)) = i$ and $\beta(r') = c$ for every off-path $r' \in (\max\{\rho^-(\theta_\delta), \tau_m\}, \theta_\delta)$. Hence, every report $r' \in (\max\{\rho^-(\theta_\delta), \tau_m\}, \theta_\delta)$ is equilibrium dominated for all $\theta < \theta'$, where $\theta' = \{\theta \in \Theta \mid C(\rho^-(\theta_\delta), \theta) = C(r', \theta)\}$. Therefore, $B(J(r'), r') = i$, and the media outlet could profitably deviate by reporting r' instead of $\rho^-(\theta_\delta)$ when $\theta \in (\theta', \theta_\delta)$. Suppose now that $\rho^-(\theta_\delta) > \theta_\delta$. By Lemma A.1 we have $\rho^-(\tau_m) = \tau_m$, and thus it has to be that $\theta_\delta > \tau_m$. Similarly to the previous case, in equilibrium it must be that $\rho(\theta) = \rho^-(\theta_\delta)$ for all $\theta \in (\tau_m, \theta_\delta)$. This is in contradiction to θ_δ being the lowest discontinuity, as we would have $\rho^+(\tau_m) > \tau_m$. Therefore, in every generic equilibrium, $\rho^-(\theta_\delta) = \theta_\delta \geq \tau_m$ and $\rho(\theta) = \theta$ for $\theta < \theta_\delta$.

From Lemmata A.1 and A.2, it follows that $\rho^+(\theta_\delta) > \theta_\delta$ and $\rho(\theta) = \rho^+(\theta_\delta)$ for every $\theta \in (\theta_\delta, \rho^+(\theta_\delta)]$: since it must be that $\beta(\rho^+(\theta_\delta)) = i$, the outlet would profitably deviate by reporting $\rho^+(\theta_\delta)$ in every state $\theta \in (\theta_\delta, \rho^+(\theta_\delta)]$ such that $\rho(\theta) > \rho^+(\theta_\delta)$. To prevent other profitable deviations, $\rho^+(\theta_\delta)$ must be such that $\xi(\theta) \leq kC(\rho^+(\theta_\delta), \theta)$ for $\theta \in (\tau_m, \theta_\delta)$ and $\xi(\theta) \geq kC(\rho^+(\theta_\delta), \theta)$ for all $\theta \in [\theta_\delta, \rho^+(\theta_\delta)]$. Together, these conditions imply that $\theta_\delta = l(\rho^+(\theta_\delta))$. Any off-path report $r' > \rho^+(\theta_\delta)$ would be equilibrium-dominated by all $\theta \leq \rho^+(\theta_\delta)$, yielding $B(J(r'), r') = i$. Therefore, it must be that $\rho(\theta) = \theta$ for all $\theta \geq \rho^+(\theta_\delta)$, and $\rho(\theta) = \rho^+(\theta_\delta)$ for $\theta \in (\theta_\delta, \rho^+(\theta_\delta))$.

Suppose now that $\theta_\delta > \tau_v$. Given the reporting rule, posterior beliefs p must be degenerate on $\theta = r$ for all $r \in [\tau_v, \theta_\delta]$. In this case, there always exists an $\epsilon > 0$ such that the outlet can profitably deviate by reporting τ_v instead of θ in states $\theta \in (\tau_v - \epsilon, \tau_v)$. Therefore, $\theta_\delta \in [\tau_m, \tau_v]$. $\qquad \square$

For the next proposition, define

$$\bar{r}(\theta) = \max\{r \in \Theta \mid kC(r, \theta) = \xi(\theta)\},$$

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[53] Recall that $\rho^+(t) = \lim_{\theta \to t^+} \rho(\theta)$ and $\rho^-(t) = \lim_{\theta \to t^-} \rho(\theta)$.

$$\zeta = \mathbb{E}_f[\theta \mid \theta \in (\tau_v, \bar{r}(\tau_v))].$$

Proposition A.1 *A pair $(\rho(\theta), p(\theta \mid r))$ is a generic equilibrium of $\hat{\Gamma}$ if and only if,*

i) *The reporting rule $\rho(\theta)$ is, for a $\lambda \in [\tau_v, \zeta)$,*

$$\rho(\theta) = \begin{cases} \hat{r}(\lambda) = \{r \in \Theta \mid \mathbb{E}_f[\theta \mid \theta \in (l(r), r)] = \lambda\} & \text{if } \theta \in \left(l\left(\hat{r}(\lambda)\right), \hat{r}(\lambda)\right) \\ \theta & \text{otherwise.} \end{cases}$$

When $\lambda = \zeta$, $\rho(\theta) = \hat{r}(\lambda)$ for $\theta \in [l(\hat{r}(\lambda)), \hat{r}(\lambda))$, and $\rho(\theta) = \theta$ otherwise.[54]

ii) *Posterior beliefs $p(\theta \mid r)$ are according to Bayes' rule whenever possible and such that $\mathbb{E}_p[\theta \mid \hat{r}(\lambda)] = \lambda$, $\mathbb{E}_p[\theta \mid r] < \tau_v$ for every off-path r, and $p(\theta \mid r)$ are degenerate on $\theta = r$ otherwise. As a result, $\beta(r, q) = i$ iff $r \geq \hat{r}(\lambda)$.*

Proof Given the reporting rule $\rho(\cdot)$ described in Lemma A.5, beliefs p must be such that $\beta(\rho^+(\theta_\delta)) = i$, and thus $\mathbb{E}_p[\theta \mid \rho^+(\theta_\delta)] = \mathbb{E}_f[\theta \mid \theta \in (\theta_\delta, \rho^+(\theta_\delta))] \geq \tau_v$, where $\theta_\delta = l(\rho^+(\theta_\delta)) \leq \tau_v$ and $\rho^+(\theta_\delta) > \tau_v$. Since $\theta_\delta = l(\rho^+(\theta_\delta)) \leq \tau_v$, we also obtain that $\mathbb{E}_p[\theta \mid \rho^+(\theta_\delta)] \leq \zeta$. Therefore, the expectation $\mathbb{E}_p[\theta \mid \rho^+(\theta_\delta)]$ induced by the report $\rho^+(\theta_\delta)$ has to be between τ_v and ζ. I define the pooling report $\hat{r}(\lambda)$ as

$$\hat{r}(\lambda) := \{r \in \mathbb{R} \mid \mathbb{E}_f[\theta \mid l(r) < \theta < r] = \lambda\}.$$

For a $\lambda \in [\tau_v, \zeta)$, we can rewrite the reporting rule described in Lemma A.5 as

$$\rho(\theta) = \begin{cases} \hat{r}(\lambda) & \text{if } \theta \in \left(l\left(\hat{r}(\lambda)\right), \hat{r}(\lambda)\right) \\ \theta & \text{otherwise.} \end{cases} \tag{4}$$

Alternatively, (4) can have $\rho(l(\hat{r}(\lambda)) = \hat{r}(\lambda)$ as long as $l(\hat{r}(\lambda)) > \tau_m$. If $\lambda = \zeta$, then it must be that (4) has $\rho(l(\hat{r}(\zeta))) = \hat{r}(\zeta)$, where $l(\hat{r}(\zeta)) = \tau_v$; otherwise the outlet could profitably deviate[55] by reporting τ_v when the state is $\theta \in (\tau_v - \epsilon, \tau_v + \epsilon)$ for some $\epsilon > 0$ (recall that the voter would select the incumbent when indifferent).

By applying Bayes' rule to (4), we obtain that posterior beliefs $p(\theta \mid r)$ are such that $\mathbb{E}_p[\theta \mid \hat{r}(\lambda)] = \lambda \in [\tau_v, \zeta]$, and are degenerate on $\theta = r$ for all $r \notin \left[l\left(\hat{r}(\lambda)\right), \hat{r}(\lambda)\right)$. For every off-path report $r' \in \left(l\left(\hat{r}(\lambda)\right), \hat{r}(\lambda)\right)$ it must be that $\mathbb{E}_p[\theta \mid r'] < \tau_v$ to have $\beta(r') = c$. These off-path beliefs are consistent with the Intuitive Criterion since for every $r' \in \left(l\left(\hat{r}(\lambda)\right), \hat{r}(\lambda)\right)$ we have that $\inf J(r') < l(\hat{r}(\lambda)) \leq \tau_v$, and thus $c \in B(J(r'), r')$. The proof is completed by the observation that the pair $(\rho(\theta), p(\theta \mid r))$ described in Proposition A.1 is indeed a generic equilibrium of $\hat{\Gamma}$ for every $\lambda \in [\tau_v, \zeta]$. $\square$

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[54] Up to changes of measure zero in $\rho(\theta)$ due to the media outlet being indifferent between reporting $l(\hat{r}(\lambda))$ and $\hat{r}(\lambda)$ when the state is $\theta = l(\hat{r}(\lambda)) > \tau_m$.

[55] This is because the voter would break indifference in favour of the incumbent. If the outlet reports $r = \tau_v$ if and only if $\theta = \tau_v$, then we would get $\beta(\tau_v) = i$, thus generating a profitable deviation for types around τ_v.

The proofs leading to Proposition A.1 consider a generic cost function, prior, and a media outlet that can be either ideological or pragmatic. It is relatively straight forward to obtain closed-form explicit solutions for the case of a quadratic loss cost function, uniform prior, and pragmatic media outlet, as it is in the main analysis. Specifically, when $C(r, \theta) = (r - \theta)^2$, $\xi(\theta) = \hat{\xi}$, and f is uniform, we have that

$$\bar{r}(\theta) = \theta + \sqrt{\hat{\xi}/k}, \ \ \zeta = \tau_v + \tfrac{1}{2}\sqrt{\hat{\xi}/k}, \ \text{and} \ l(\rho^+(\theta_\delta)) = \max\left\{\rho^+(\theta_\delta) - \sqrt{\hat{\xi}/k}, \tau_m\right\}.$$

As a result, the expectation $\lambda = \mathbb{E}_p[\theta \mid \rho^+(\theta_\delta)]$ has to be between τ_v and $\tau_v + \tfrac{1}{2}\sqrt{\hat{\xi}/k}$. Finally, the pooling report is $\hat{r}(\lambda) = \lambda + \tfrac{1}{2}\sqrt{\hat{\xi}/k}$ if $l(\hat{r}(\lambda)) > \tau_m$ and $\hat{r}(\lambda) = 2\lambda - \tau_m$ otherwise.

Proof of Lemma 1 For the case $\tau_m < \tau_v$, Proposition A.1 shows that there is a continuum of generic equilibria of $\hat{\Gamma}$ parameterized by the expectation $\lambda = \mathbb{E}_p[\theta \mid \hat{r}(\lambda)]$. Given a uniform prior f, costs $C(r, \theta)$, $\lambda \in [\tau_v, \zeta]$, and $\tau_m < \tau_v$, in a generic equilibrium there is persuasion when $\theta \in (l(\hat{r}(\lambda)), \tau_v)$. Next, I show that $\lambda = \tau_v$ maximizes the media outlet's expected equilibrium payoff. For every $\lambda \in (\tau_v, \zeta]$, if $l(\hat{r}(\tau_v)) > \tau_m$, then $l(\hat{r}(\lambda)) > l(\hat{r}(\tau_v))$; if $l(\hat{r}(\tau_v)) = \tau_m$ (which can be the case when $\xi(\theta) = \hat{\xi}$ and k is sufficiently low), then $l(\hat{r}(\lambda)) \geq \tau_m$ and $\hat{r}(\lambda) > \hat{r}(\tau_v)$. That is, in the generic equilibrium where $\lambda = \tau_v$, the media outlet is either more likely to persuade the voter at the same expected cost, or is at least equally likely to persuade the voter at a strictly lower cost compared to generic equilibria where $\lambda > \tau_v$. The sender-preferred equilibrium reporting rule $\rho(\cdot)$ and beliefs p follow from Proposition A.1, where the case $\tau_m > \tau_v$ is obtained in a similar way as $\tau_m < \tau_v$, and the case $\tau_m = \tau_v$ follows by setting $\tau_m \to \tau_v$ in the generic equilibrium of Proposition A.1 where $\lambda = \tau_v$. □

A.2 The policy-making stage

A.2.1 Pragmatic media

Consider the game with a pragmatic media outlet. Given the communication subgame $\hat{\Gamma}$'s equilibrium (see Lemma 1) and a policy proposal by the incumbent q_i, the expected utility of the challenger is $V_c(q) = l(r^*(q))$ if $\tau_m(q) < \tau_v(q)$, and $V_c(q) = h(r^*(q))$ if $\tau_m(q) > \tau_v(q)$. We have that $\tau_m(q) = \tau_v(q)$ only if $q_c = q_i$; in this case, the challenger ensures her electoral victory half the time by mimicking the incumbent's proposal, and $V_c(q) = 0$. By contrast, $\tau_v(q) > \tau_m(q)$ when $q_c > q_i$, and $\tau_v(q) < \tau_m(q)$ otherwise. I define the "best response to the left" $BR_c^L(q_i)$ as the best response of the challenger to policy q_i subject to the constraint that $q_c \leq q_i$, that is, $BR_c^L(q_i) = \arg\max_{q_c \leq q_i} V_c(q)$. The "best response to the right" is similarly defined as $BR_c^R(q_i) = \arg\max_{q_c \geq q_i} V_c(q)$.

Step 1 *The challenger's "best response to the left" $BR_c^L(q_i)$ is,*

$$BR_c^L(q_i) = \begin{cases} q_i & \text{if } q_i \leq \varphi_m \\[2ex] \varphi_m & \text{if } q_i \in \left[\varphi_m, \varphi_m + \dfrac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}\right] \\[3ex] \tilde{q}_c(q_i) = q_i - \dfrac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)} & \text{if } q_i \in \left[\varphi_m + \dfrac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}, \varphi_v + \dfrac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}\right] \\[3ex] \varphi_v & \text{if } q_i \geq \varphi_v + \dfrac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}. \end{cases}$$

Proof Given $q_c < q_i$ and the equilibrium in Lemma 1, the challenger wins when $\theta < h(r^*(q))$, where $h(r^*(q)) = \min\left\{r^*(q) + \sqrt{\hat{\xi}/k}, \tau_m(q)\right\}$ and

$$r^*(q) = \max\left\{\tau_v(q) - \frac{1}{2}\sqrt{\hat{\xi}/k}, 2\tau_v(q) - \tau_m(q)\right\}.$$

When $h(r^*(q)) < \tau_m(q)$, the pooling report is $r^*(q) = \tau_v(q) - \frac{1}{2}\sqrt{\hat{\xi}/k}$, and thus $\frac{\partial h(r^*(q))}{\partial q_c} = 2\gamma(\varphi_v - q_c) > 0$ and $\frac{\partial \tau_m(q)}{\partial q_c} = 2\gamma(\varphi_m - q_c) < 0$ for all $q_c \in [\varphi_m, \varphi_v]$. Thus, the expected utility of the challenger $V_c(q) = h(r^*(q))$ is maximized, subject to $q_c < q_i$, when q_c is such that $h(r^*(q)) = \tau_m(q)$. This last equality is satisfied when $q_c = \tilde{q}_c(q_i)$, where

$$\tilde{q}_c(q_i) = q_i - \frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}. \tag{5}$$

Therefore, as long as $\tilde{q}_c(q_i) \in [\varphi_m, \varphi_v]$, we have that $BR_c^L(q_i) = \tilde{q}_c(q_i)$. Since policies $q_j \notin [\varphi_m, \varphi_v]$, $j \in \{i, c\}$, are never optimal, it follows that if $\tilde{q}_c(q_i) < \varphi_m \leq q_i$, then $BR_c^L(q_i) = \varphi_m$; if $q_i < \varphi_m$, then $BR_c^L(q_i) = q_i$; if $\tilde{q}_c(q_i) > \varphi_v$, then $BR_c^L(q_i) = \varphi_v$. The proof is completed by solving for these inequalities. □

Step 2 *The challenger's "best response from the right" $BR_c^R(q_i)$ is,*

$$BR_c^R(q_i) = \begin{cases} \varphi_v & \text{if } q_i < \varphi_v - \sqrt{\dfrac{1}{2\gamma}\sqrt{\dfrac{\hat{\xi}}{k}}} \\[2ex] q_i & \text{otherwise.} \end{cases}$$

Proof Given $q_c > q_i$ and the equilibrium in Lemma 1, the challenger wins the election when $\theta < l(r^*(q))$. Since $\frac{\partial l(r^*(q))}{\partial q_c} = \frac{\partial h(r^*(q))}{\partial q_c}$, we can proceed as in Step 1: the policy q_c such that $l(r^*(q)) = \tau_m(q)$ minimizes $V_c(q)$ subject to $q_c \geq q_i$, and thus $BR_c^R(q_i) = \varphi_v$ as long as $l(r^*(q_i, \varphi_v)) > 0$. Otherwise, the challenger would be better off by imitating the incumbent with $q_c = q_i$, thereby ensuring herself a payoff

of $V_c(q) = 0$. The condition $l(r^*(q_i, \varphi_v)) > 0$ is satisfied by $q_i < \varphi_v - \sqrt{\frac{1}{2\gamma}\sqrt{\hat{\xi}/k}}$, completing the proof. $\qquad\square$

Proposition A.2 *The challenger's best response $BR_c(q_i)$ to a policy $q_i \in [\varphi_m, \varphi_v]$ is,*

$$BR_c(q_i) = \begin{cases} \varphi_v & \text{if } q_i \in \left[\varphi_m, \varphi_v + \eta(k) - \sqrt[4]{\frac{\hat{\xi}}{\gamma^2 k}}\right] \text{ and } k \geq \bar{k} \\ q_i - \eta(k) & \text{if } q_i \in \left[\varphi_v + \eta(k) - \sqrt[4]{\frac{\hat{\xi}}{\gamma^2 k}}, \varphi_v\right] \text{ and } k \geq \bar{k} \\ \varphi_v & \text{if } q_i \in \left[\varphi_m, \frac{\varphi_v + \varphi_m}{2} - \eta(k)\right] \text{ and } k \in (0, \bar{k}] \\ \varphi_m & \text{if } q_i \in \left[\frac{\varphi_v + \varphi_m}{2} - \eta(k), \varphi_m + \eta(k)\right] \text{ and } k \in (0, \bar{k}] \\ q_i - \eta(k) & \text{if } q_i \in [\varphi_m + \eta(k), \varphi_v] \text{ and } k \in (0, \bar{k}], \end{cases}$$

where $\eta(k) = \frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}$ and $\bar{k} = \frac{\hat{\xi}}{\gamma^2(\varphi_v - \varphi_m)^4}$.

Proof Given a policy $q_i \in [\varphi_m, \varphi_v]$ and best responses $BR_c^L(q_i), BR_c^R(q_i)$ as in Steps 1 and 2, we have that $\frac{\partial V_c(q_i, BR_c^R(q_i))}{\partial q_i} \leq 0 \leq \frac{\partial V_c(q_i, BR_c^L(q_i))}{\partial q_i}$. Therefore, if there is a $q_i' \in [\varphi_m, \varphi_v]$ such that $V_c\left(q_i', BR_c^R(q_i')\right) = V_c\left(q_i', BR_c^L(q_i')\right)$, then $BR_c(q_i) = BR_c^R(q_i)$ for all $q_i \in [\varphi_m, q_i']$ and $BR_c(q_i) = BR_c^L(q_i)$ for all $q_i \in [q_i', \varphi_v]$. As a first step, I compare $V_c(q_i, \tilde{q}_c(q_i))$ and $V_c(q_i, \varphi_v)$. When $q_c < q_i$ and $(q_c - q_i)^2 \leq \frac{\hat{\xi}}{16\gamma^2 k(\varphi_m - \varphi_v)^2}$, we have that $h(r^*(q_i, q_c)) = \tau_m(q_i, q_c)$, and therefore $V_c(q_i, \tilde{q}_c(q_i)) = \tau_m(q_i, \tilde{q}_c(q_i))$ and $V_c(q_i, \varphi_v) = l(r^*(q_i, \varphi_v)) = \gamma(\varphi_v - q_i)^2 - \frac{1}{2}\sqrt{\hat{\xi}/k}$. The challenger's expected utility from "best replying to the left" with $\tilde{q}_c(q_i)$ is

$$V_c(q_i, \tilde{q}_c(q_i)) = \frac{1}{2}\sqrt{\hat{\xi}/k} - \gamma\left[2(\varphi_v - q_i) + \frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}\right]\frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}.$$

Thus, the condition $\tau_m(q_i, \tilde{q}_c(q_i)) = l(r^*(q_i, \varphi_v))$ can be rewritten as

$$\gamma(\varphi_v - q_i)^2 + 2\gamma\frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}(\varphi_v - q_i) + \gamma\left(\frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}\right)^2 - \sqrt{\hat{\xi}/k} = 0.$$

By solving a quadratic equation in $(\varphi_v - q_i)$, I obtain that the threshold $\bar{q}'$ such that $V_c\left(\bar{q}', BR_c^R(\bar{q}')\right) = V_c\left(\bar{q}', BR_c^L(\bar{q}')\right)$ is,

$$\bar{q}' = \varphi_v + \frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)} - \sqrt[4]{\frac{\hat{\xi}}{\gamma^2 k}}.$$

Since $V_c(q_i, q_i) = 0$, I do not need to consider the case where $BR_c^R(q_i) = q_i$ as the challenger can always get a positive expected utility $V_c(q_i, q_c') = \gamma(q_c' - q_i)^2 \geq 0$ by proposing $q_c' = \max\{\varphi_m, \tilde{q}_c(q_i)\}$. Since $BR_c^L(q_i) = \varphi_m$ when $\tilde{q}_c(q_i) < \varphi_m$ and $q_i \in [\varphi_m, \varphi_v]$, the comparison between $V_c(q_i, \tilde{q}_c(q_i))$ and $V_c(q_i, \varphi_v)$ makes sense as long as $\tilde{q}_c(q_i) \geq \varphi_m$ for all $q_i \in [\bar{q}', \varphi_v]$. Given that $\frac{\partial \tilde{q}_c(q_i)}{\partial q_i} = 1$, the condition is $\tilde{q}_c(\bar{q}') \geq \varphi_m$ or $k \geq \bar{k}$, where

$$\bar{k} = \frac{\hat{\xi}}{\gamma^2(\varphi_v - \varphi_m)^4}.$$

If $k \in (0, \bar{k})$, then we have that $\tilde{q}_c(q_i) < \varphi_m$ and thus $BR_c^L(q_i) = \varphi_m$ for some $q_i \geq \bar{q}'$. In this case, the relevant comparison is between $V_c(q_i, \varphi_m) = \tau_m(q_i, \varphi_m)$ and $V_c(q_i, \varphi_v)$: by equating $\tau_m(q_i, \varphi_m) = l(r^*(q_i, \varphi_v))$ we get that the threshold is

$$\bar{q}'' = \frac{\varphi_v + \varphi_m}{2} - \frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}.$$

Note that $\bar{q}' = \bar{q}'' = \varphi_m + \frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}$ when $k = \bar{k}$. Therefore, when $k \in (0, \bar{k})$ we have that $BR_c(q_i) = \varphi_v$ for all $q_i \in [\varphi_m, \bar{q}'']$ and $BR_c(q_i) = BR_c^L(q_i)$ for $q_i \in [\bar{q}'', \varphi_v]$. Moreover, $BR_c^L(q_i) = \tilde{q}_c(q_i)$ as long as $\tilde{q}_c(q_i) \geq \varphi_m$, and $BR_c^L(q_i) = \varphi_m$ otherwise. We have that $\tilde{q}_c(q_i) \geq \varphi_m$ when $q_i \geq \bar{q}'''$, where

$$\bar{q}''' = \varphi_m + \frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}.$$

The proposition follows by replacing $\eta(k) = \frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}$. □

Proof of Proposition 2 I denote by $\hat{V}_i(q_i) \equiv V_i(q_i, BR_c(q_i))$ the utility of the incumbent given that $q_i \in [\varphi_m, \varphi_v]$ and $q_c = BR_c(q_i)$, where the challenger's best response $BR_c(q_i)$ is as in Proposition A.2. Since an equilibrium is a sender-preferred PBE, when the challenger is indifferent between some policies, she selects the policy that is closer to the media outlet's bliss φ_m. Given that $h(r^*(q_i, q_c)) = \tau_m(q_i, q_c)$ for $q_c = \max\{\varphi_m, \tilde{q}_c(q_i)\}$, we have that

$$\hat{V}_i(q_i) = \begin{cases} -l(r^*(q_i, \varphi_v)) & \text{if } q_i \in \left[\varphi_m, \varphi_v + \eta(k) - \sqrt[4]{\frac{\hat{\xi}}{\gamma^2 k}}\right) \text{ and } k \geq \bar{k} \\[2ex] -\tau_m(q_i, \tilde{q}_c(q_i)) & \text{if } q_i \in \left[\varphi_v + \eta(k) - \sqrt[4]{\frac{\hat{\xi}}{\gamma^2 k}}, \varphi_v\right] \text{ and } k \geq \bar{k} \\[2ex] -l(r^*(q_i, \varphi_v)) & \text{if } q_i \in \left[\varphi_m, \frac{\varphi_v + \varphi_m}{2} - \eta(k)\right) \text{ and } k \in (0, \bar{k}] \\[2ex] -\tau_m(q_i, \varphi_m) & \text{if } q_i \in \left[\frac{\varphi_v + \varphi_m}{2} - \eta(k), \varphi_m + \eta(k)\right] \text{ and } k \in (0, \bar{k}] \\[2ex] -\tau_m(q_i, \tilde{q}_c(q_i)) & \text{if } q_i \in [\varphi_m + \eta(k), \varphi_v] \text{ and } k \in (0, \bar{k}], \end{cases}$$

where $\eta(k) = \frac{\sqrt{\hat{\xi}/k}}{4\gamma(\varphi_v - \varphi_m)}$ and $\bar{k} = \frac{\hat{\xi}}{\gamma^2(\varphi_v - \varphi_m)^4}$. Henceforth, I will use the following notation: $\bar{q}' = \varphi_v + \eta(k) - \sqrt[4]{\frac{\hat{\xi}}{\gamma^2 k}}$, $\bar{q}'' = \frac{\varphi_v + \varphi_m}{2} - \eta(k)$, and $\bar{q}''' = \varphi_m + \eta(k)$.

When $k \geq \bar{k}$, the utility $\hat{V}_i(q_i)$ is increasing in q_i until $q_i = \bar{q}'$, and decreasing afterwards, as $\frac{\partial \hat{V}_i(q_i)}{\partial q_i} = 2\gamma(\varphi_v - q_i) > 0$ for $q_i \in [\varphi_m, \bar{q}']$ and $\frac{\partial \hat{V}_i(q_i)}{\partial q_i} = 2\gamma(\varphi_m - q_i) < 0$ for $q_i \in [\bar{q}', \varphi_v]$. Since $-l(r^*(\bar{q}', \varphi_v)) = -\tau_m(q_i, \tilde{q}_c(q_i))$, it follows that $q_i = \bar{q}'$ maximizes $\hat{V}_i(q_i)$ for $k \geq \bar{k}$. The challenger replies to $q_i = \bar{q}'$ with the sender-preferred policy $q_c = \tilde{q}_c(\bar{q}')$.

There are three different configurations to consider when the misreporting costs are lower than $\bar{k}$: (i) when $\bar{k}/4 \leq k < \bar{k}$, the relevant thresholds are contained within the bliss policies of the voter and the media outlet, $\varphi_m \leq \bar{q}'' < \bar{q}''' < \varphi_v$; (ii) when $\bar{k}/16 \leq k < \bar{k}/4$, the threshold $\bar{q}''$ is lower than the media outlet's bliss φ_m, and we have $\bar{q}'' < \varphi_m < \bar{q}''' \leq \varphi_v$; (iii) when $0 < k < \bar{k}/16$, both thresholds are beyond the bliss policies, $\bar{q}'' < \varphi_m < \varphi_v < \bar{q}'''$.

In the first case, where $k \in [\bar{k}/4, \bar{k})$, we have that $\frac{\partial \hat{V}_i(q_i)}{\partial q_i} = \frac{\partial -l(r^*(q_i, \varphi_v))}{\partial q_i} = 2\gamma(\varphi_v - q_i) > 0$ for $q_i \in [\varphi_m, \bar{q}'']$; $\frac{\partial \hat{V}_i(q_i)}{\partial q_i} = \frac{\partial -\tau_m(q_i, \varphi_m)}{\partial q_i} = 2\gamma(\varphi_m - q_i) < 0$ for $q_i \in [\bar{q}'', \bar{q}''']$; and $\frac{\partial \hat{V}_i(q_i)}{\partial q_i} = \frac{\partial -h(r^*(q_i, \tilde{q}_c(q_i)))}{\partial q_i} = -\frac{\sqrt{\hat{\xi}/k}}{2(\varphi_v - \varphi_m)} < 0$ for $q_i \in [\bar{q}''', \varphi_v]$. Since $-l(r^*(\bar{q}'', \varphi_v)) = -\tau_m(\bar{q}'', \varphi_m)$ and $-h(r^*(q_i, \tilde{q}_c(q_i))) = -\tau_m(\bar{q}''', \varphi_m)$, we have that when $k \in [\bar{k}/4, \bar{k})$ the incumbent maximizes $\hat{V}_i(q_i)$ by selecting $q_i = \bar{q}''$, and the challenger best responds to $\bar{q}''$ by proposing the sender-preferred policy $q_c = \varphi_m$.

The same line of reasoning can be extended to the other two cases: when $\bar{k}/16 \leq k < \bar{k}/4$, the incumbent proposes $q_i = \bar{q}''$ and the challenger replies with $q_c = \varphi_m$; when $0 < k < \bar{k}/16$, both the incumbent and the challenger propose $q_j = \varphi_m$, $j \in \{i, c\}$. The proposition follows by denoting $q_i^*(k) = \arg\max_{q_i \in \mathbb{R}} \hat{V}_i(q_i)$ and $q_c^*(q_i, k) = \min BR_c(q_i)$. $\qquad\square$

Before moving to the next part, I show that the incumbent's equilibrium policy proposal is strictly increasing in k for finite $k > \bar{k}$. Consider the equilibrium policy $q_i^*(k)$ for a pragmatic media outlet when $k > \bar{k}$. Its derivative with respect to k is

$$\frac{dq_i^*(k)}{dk}\bigg|_{k > \bar{k}} = \frac{\sqrt[4]{\hat{\xi}/k}\left(\frac{1}{\sqrt{\gamma}} - \frac{2}{4\gamma(\varphi_v - \varphi_m)}\sqrt[4]{\hat{\xi}/k}\right)}{4k}.$$

Such a derivative is strictly positive provided that

$$k > \frac{\hat{\xi}}{16\gamma^2(\varphi_v - \varphi_m)^4} = \bar{k}/16.$$

The condition is satisfied because $k > \bar{k} > \bar{k}/16$.

A.2.2 Purely policy-motivated media

This section considers an additional variation of the media outlet's payoff that is useful to prove results pertinent to the ideological media case. Here, the media outlet's preferences over political outcomes depend solely on the candidates' policies, and not on the realized state. Specifically, consider the case where the outlet obtains $-\gamma(\varphi_m - q_b)^2 - k(r - \theta)^2$ when reporting r in state θ and the voter elects candidate $b \in \{i, c\}$. Given policies q, the amount of resources that the media outlet is willing to use for misreporting information is at most $|\tau_m(q)|$. Hereafter, I denote this amount with $\tilde{\xi}(q) = |\tau_m(q)|$, and will refer to an outlet with $\xi(\theta, q) = \tilde{\xi}(\theta)$ as a purely policy-motivated media. To differentiate this case with the rest of the analysis, I will denote the highest misreporting type, lowest misreporting type, and pooling report with $\tilde{h}$, $\tilde{l}$, and $\tilde{r}^*$, respectively.[56] The next result shows qualitative similarities between the equilibrium policy outcomes described in Proposition 2 and those in the game with a purely policy-motivated media.

Proposition A.3 *The equilibrium policy outcomes in the game with a purely policy-motivated media are such that,*

i) *There exists a finite $\tilde{k} > 0$ such that $q_c^*(q_i^*(k), k) \neq q_i^*(k) > \varphi_m$ for every finite $k \geq \tilde{k}$,*
ii) $\lim_{k \to 0^+} q^*(k) = (\varphi_m, \varphi_m)$,
iii) $\lim_{k \to \infty} q^*(k) = (\varphi_v, \varphi_v)$.

Proof The analysis of the communication subgame remains essentially unaltered. Given proposals q, the gains $\xi(\theta, q) = \tilde{\xi}(q)$ are fixed and known by the voter. As a result, equilibria of the communication subgame for the case of a purely policy-motivated media are analogous to those of a pragmatic media, where $\xi(\theta, q) = \hat{\xi}$.

Hereafter, I refer to the analysis previously performed in Appendix A.2.1. Consider the challenger's "best response to the left," with $q_c \leq q_i$ and $q_i > \varphi_m$ (when $q_i = \varphi_m$ the best response to the left is $q_c = \varphi_m$). In this case, we have that $\tilde{\xi}(q) = \tau_m(q) \geq 0$. Recall that, in equilibrium, the challenger wins the election when $\theta < \tilde{h}(\tilde{r}^*(q))$, where in the case studied here we have $\tilde{h}(\tilde{r}^*(q)) = \tau_v(q) + \frac{1}{2}\sqrt{\tau_m(q)/k}$. Differently than the pragmatic media outlet case, here the derivative $\frac{d\tilde{h}(\tilde{r}^*(q))}{dq_c}$ is not always positive. Since $\tilde{h}(\tilde{r}^*(q))$ is concave in q_c, $\tilde{h}(\tilde{r}^*(\cdot))$ has a maximum when q_c is such that $\frac{d\tilde{h}(\tilde{r}^*(q))}{dq_c} = 0$. Therefore, the challenger maximizes her payoff when q_c is such that $\frac{d\tilde{h}(\tilde{r}^*(q))}{dq_c} = 0$.

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[56] The highest misreporting type, lowest misreporting type, and pooling report of the game with a purely policy-motivated media are defined similarly as in the main analysis. In this case, the score $\tau_m(q)$ cannot be interpreted as the media's preference threshold: given policies, the outlet has a preferred candidate that is independent of the state. As a result, we can have that the lowest and highest misreporting types are $\tilde{l}(r) < \tau_m(q) < \tilde{h}(r')$ given reports $r' < \tau_m(q) < r$. The "influential news" condition (Corollary A.1), remains a sufficient condition for equilibria of the communication subgame to be as described by Proposition A.1.

In particular, we have that

$$\frac{d\tilde{h}\left(\tilde{r}^*(q)\right)}{dq_c} = \underbrace{2\gamma\left(\varphi_v - q_c\right)}_{\geq 0} + \underbrace{\frac{1}{4k}\sqrt{\frac{k}{\tau_m(q)}}2\gamma\left(\varphi_m - q_c\right)}_{\leq 0}.$$

When $\frac{d\tilde{h}(\tilde{r}^*(q_i, q_c^*))}{dq_c} = 0$, the solution q_c^* implicitly satisfies

$$\frac{\varphi_v - q_c^*}{q_c^* - \varphi_m} = \frac{1}{4k}\sqrt{\frac{k}{\tau_m(q_i, q_c^*)}}.$$

The left-hand side of the above equation is always positive for $q_c \in (\varphi_m, \varphi_v)$, it is decreasing in q_c, and it has a vertical asymptote at φ_m. In particular, the LHS goes to ∞ as $q_c \downarrow \varphi_m$. The right-hand side of the above equation is always positive, increasing in q_c, and it has a vertical asymptote such that the RHS goes to ∞ as $q_c \uparrow q_i$. Therefore, the solution to the above equation is some $q_c^* \in (\varphi_m, q_i)$. The challenger is strictly better off when best replying to the left with $q_c^* < q_i$ rather than by imitating the incumbent and getting $\tilde{h}(r^*(q_i, q_i)) = 0$. As a result, it must be that $V_c(q_i, q_c^*) = \tilde{h}(\tilde{r}^*(q_i, q_c^*)) > 0$. In contrast with the pragmatic media case, the challenger does not "best reply to the left" to some $q_i > \varphi_m$ with the outlet's preferred policy φ_m, even when k is relatively small.[57]

The analysis of the "best response to the right" $BR_c^R(q_i)$, where $q_c \geq q_i$, is similar (see also Appendix A.2.1). In this case, we have that $\hat{\xi}(q) = -\tau_m(q) \geq 0$ and, in equilibrium, the challenger wins when $\theta < \tilde{l}(\tilde{r}^*(q)) = \tau_v(q) - \frac{1}{2}\sqrt{-\tau_m(q)/k}$. As in the analysis in Appendix A.2.1, we still have that $\frac{d\tilde{l}(\tilde{r}^*(q))}{dq_c} = \frac{d\tilde{h}(\tilde{r}^*(q))}{dq_c}$. The incumbent never finds it optimal to propose $q_i = \varphi_m$ when k is sufficiently high. Otherwise, the challenger can best respond to the right with some $BR_c^R(\varphi_m) \in (\varphi_m, \varphi_v]$ and get $V_c(\varphi_m, BR_c^R(\varphi_m)) = \tilde{l}(\tilde{r}^*(\varphi_m, BR_c^R(\varphi_m)))$. When k is sufficiently high, $\tilde{l}(\tilde{r}^*(\varphi_m, BR_c^R(\varphi_m))) > V_c(q_i, BR_c(q_i))$ for any $q_i \in (\varphi_m, \varphi_v]$. Since $V_i = -V_c$, the incumbent is better off with some $q_i > \varphi_m$.

As in the baseline model, the incumbent seeks to minimize the challenger's expected payoff. From the above analysis, we know that when $q_i > \varphi_m$ the challenger can secure an expected payoff of $V_c(q_i, BR_c^L(q_i)) > 0$ with $BR_c^L(q_i) \neq q_i$. By proposing policies that are closer to φ_v, the incumbent increases the challenger's payoff from best responding to the left. To see this, consider $q_i' > q_i$ such that $\varphi_m \leq q_i < q_i' \leq \varphi_v$. When the incumbent proposes q_i', the challenger has the option of proposing a $q_c' \in (BR_c^L(q_i), q_i')$ such that $q_i' - q_c' = q_i - BR_c^L(q_i)$. This strategy maintains unaltered the distance $|\tau_v(q) - \tau_m(q)| \propto |q_c - q_i|$, it increases the outlet's political gains $\hat{\xi}(q) = \tau_m(q)$, and it also increases the voter's threshold $\tau_v(q)$. Therefore, $V_c(q_i', q_c') = \tilde{h}(\tilde{r}^*(q_i', q_c')) > \tilde{h}(\tilde{r}^*(q_i, BR_c^L(q_i))) = V_c(q_i, BR_c^L(q_i))) > 0$. It follows that $V_c(q_i, BR_c^L(q_i))$ is increasing with q_i.

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[57] Notice that here we have $\tilde{h}(\tilde{r}^*(q_i, q_c = \varphi_m)) = (\varphi_m - q_i)\left[\gamma(\varphi_v - \varphi_m + \varphi_v - q_i) + \sqrt{\gamma/4k}\right] < 0$.

To sum up, when costs k are sufficiently high, the incumbent optimally proposes a policy $q_i^*(k) > \varphi_m$. The challenger always best replies to $q_i^*(k) > \varphi_m$ with a different policy $q_c^*(q_i^*(k), k) \neq q_i^*(k)$. As long as costs k are high enough but finite, the candidates propose different policies in equilibrium.

The extent to which the media outlet can persuade the voter depends on the ratio $\tilde{\xi}(q)/k$. When misreporting costs grow arbitrarily large, $k \to +\infty$, the outlet always reveals the state and the policies of both candidates converge to φ_v. By contrast, when $k \to 0^+$, the policies of both candidates converge to φ_m. To see this, suppose that $q_i = \varphi_m$ and $q_c \in (\varphi_m, \varphi_v]$. No matter how close q_i and q_c are, the outlet obtains full persuasion when costs k are low enough. Therefore, the incumbent wins when $\theta > \tilde{l}(\tilde{r}^*(\varphi_m, q_c))$, where $\tilde{l}(\tilde{r}^*(\varphi_m, q_c)) \leq \tau_m(\varphi_m, q_c) < 0$ for sufficiently low k. The expected payoff of the challenger is lower than the payoff she would get by proposing φ_m as well, $V_c(\varphi_m, q_c) < 0 = V_c(\varphi_m, \varphi_m)$. In this case, the incumbent can secure a payoff of at least 0 by proposing φ_m. As we have seen before, any $q_i > \varphi_m$ would grant the incumbent a negative payoff, even for small k. Therefore, when costs k are sufficiently low, candidates optimally propose $q_i = q_c = \varphi_m$. $\qquad\square$

A.2.3 Ideological media

Proof of Proposition 1 Suppose first that $q_i > \varphi_m$. When the media outlet is purely policy-motivated (Sect. A.2.2), the challenger could "best reply to the left" by proposing a $q_c^* \in (\varphi_m, q_i)$ and inducing $\tilde{h}(\tilde{r}^*(q_i, q_c^*)) > 0$. Consider this pair of policies $q = (q_i, q_c^*)$ and notice that $\xi(\theta, q) \lessgtr \hat{\xi}(q)$ when $\theta \gtrless 0$ and $\xi(\theta, q) = \hat{\xi}(q)$ when $\theta = 0$. It follows that $0 < h(r^*(q_i, q_c^*)) < \tilde{h}(\tilde{r}^*(q_i, q_c^*))$ and $r^*(q_i, q_c^*) > \tilde{r}^*(q_i, q_c^*)$. Suppose by way of contradiction that $h(r^*(q_i, q_c^*)) \leq 0$. When $\theta = \epsilon$, for some $\epsilon > 0$ small enough, we have $\xi(q, \epsilon) \approx \hat{\xi}(q)$. Since $r^*(q_i, q_c^*) > \tilde{r}^*(q_i, q_c^*)$, at state $\theta = \epsilon$ the outlet would rather deliver $r^*(q_i, q_c^*)$ and induce the election of the challenger rather than report truthfully and let the incumbent win. As a result, it must be that $h(r^*(q_i, q_c^*)) > 0$. This implies that, for any finite k, the challenger can secure at least $V_c(q_i, q_c^*) > 0$ by proposing $q_c^* < q_i$ when $q_i > \varphi_m$. Similarly, when $q_i = \varphi_m$ there is a finite k high enough such that, for some $q_c \in (\varphi_m, \varphi_v]$, $l(r^*(\varphi_m, q_i)) > 0$, meaning that for sufficiently high k the challenger prefers to separate from the incumbent by proposing a policy that is relatively more appealing to the voter. This last result follows from the observation that l and r^* vary monotonically and continuously with k, and $\lim_{k \to +\infty} l(r^*(q)) = \lim_{k \to +\infty} r^*(q) = \tau_v(q) > 0$. The candidates optimally propose different policies when costs k are finite and high enough.

The analysis of the cases where $k \to +\infty$ and $k \to 0^+$ is similar as that for a purely policy-motivated outlet: when misreporting costs grow arbitrarily large, $k \to +\infty$, the outlet always reveals the state and the policies of both candidates converge to φ_v; when misreporting costs shrink[58] to zero, $k \to 0^+$, policies converge to φ_m. $\qquad\square$

---

[58] For any q such that $\varphi_v \geq q_c > q_i \geq \varphi_m$, we have that $lim_{k \to 0^+} l(r^*(q)) = \tau_m(q) < 0$.

A.3 Voter's Welfare

A.3.1 Pragmatic Media

Consider the pragmatic media case, where $\xi(\theta, q) = \hat{\xi} > 0$. To ease notation, in this section I will use $q_c^*(q_i^*(k), k) \equiv q_c^*(q_i^*(k))$.

Proof of Proposition 4 Proposition 2 shows that equilibrium policies $q^*(k)$ are such that $q_i^*(k) \geq q_c^*(q_i^*(k))$ for every $k > 0$. Moreover, since

$$\left(q_c^*\left(q_i^*(k)\right) - q_i^*(k)\right)^2 \leq \frac{\hat{\xi}}{16\gamma^2 k(\varphi_m - \varphi_v)^2},$$

we have that $h(r^*(q^*(k))) = \tau_m(q^*(k))$ for every $k > 0$. Given the equilibrium of the communication subgame $\hat{\Gamma}$ (Proposition A.1 and Lemma 1) and that $\theta \sim \mathcal{U}[-\phi, \phi]$, the incumbent wins with ex-ante probability $\frac{\phi - \tau_m(q^*(k))}{2\phi}$. When the incumbent is elected, the voter receives an expected utility of $-\gamma(\varphi_v - q_i^*(k))^2 + \mathbb{E}_f\left[\theta \mid \theta > \tau_m(q^*(k))\right]$, where $\mathbb{E}_f\left[\theta \mid \theta > \tau_m(q^*(k))\right] = \frac{\phi + \tau_m(q^*(k))}{2}$. When the challenger is elected, the voter obtains a utility of $-\gamma(\varphi_v - q_c^*(q_i^*(k)))^2$. Therefore, the voter's equilibrium welfare can be written as

$$
\begin{aligned}
W_v^*(k) = {} & \left(\frac{\tau_m(q^*(k)) + \phi}{2\phi}\right)\left[-\gamma(\varphi_v - q_c^*(q_i^*(k)))^2\right] \\
& + \left(\frac{\phi - \tau_m(q^*(k))}{2\phi}\right)\left[-\gamma(\varphi_v - q_i^*(k))^2 + \frac{\phi + \tau_m(q^*(k))}{2}\right].
\end{aligned}
\tag{6}
$$

When $k \in \left(0, \bar{k}/4\right)$, since $\tau_m(q) = 0$ for $q = (\varphi_m, \varphi_m)$, Eq. (6) reduces to $W_v^*(k) = -\gamma(\varphi_v - \varphi_m)^2 + \phi/4$. Therefore, the voter's equilibrium welfare $W_v^*(k)$ is independent of k for all $k \in \left(0, \bar{k}/4\right)$.

Consider now the case where $k \in \left[\bar{k}/4, \bar{k}\right]$. The derivative of the voter's welfare with respect to the misreporting costs k is

$$
\begin{aligned}
\frac{\partial W_v^*(k)}{\partial k} = {} & \left(\frac{\phi - \tau_m(q^*(k))}{2\phi}\right)\left[\frac{1}{2}\frac{\partial \tau_m(q^*(k))}{\partial k} - \frac{\partial \tau_v(q^*(k))}{\partial k}\right] \\
& - \left(\frac{1}{2\phi}\frac{\partial \tau_m(q^*(k))}{\partial k}\right)\left[\frac{\phi + \tau_m(q^*(k))}{2} - \tau_v(q^*(k))\right].
\end{aligned}
\tag{7}
$$

For $k \in \left[\bar{k}/4, \bar{k}\right]$, we obtain the following derivatives: $\frac{\partial q_i^*(k)}{\partial k} = \frac{1}{4\gamma(\varphi_v - \varphi_m)}\frac{1}{2\sqrt{\hat{\xi}/k}}\frac{\hat{\xi}}{k^2} > 0$, $\frac{\partial \tau_m(q^*(k))}{\partial k} = 2\gamma(q_i^*(k) - \varphi_m)\frac{\partial q_i^*(k)}{\partial k} > 0$, and $\frac{\partial \tau_v(q^*(k))}{\partial k} = -2\gamma(\varphi_v - q_i^*(k))\frac{\partial q_i^*(k)}{\partial k} < 0$. Moreover, notice that $\tau_v(q^*(k)) - \tau_m(q^*(k)) = 2\gamma(\varphi_m - q_i^*(k))(\varphi_v - \varphi_m)$ and $\tau_m(q^*(k)) = \gamma(\varphi_m - q_i^*(k))^2$. Therefore, Eq. (7) can be rewritten

as

$$\frac{\partial W_v^*(k)}{\partial k} = \frac{\gamma}{\phi} \frac{\partial q_i^*(k)}{\partial k} \left[(\phi - \tau_m(q^*(k)))(\varphi_v - q_i^*(k)) - 2\gamma(q_i^*(k) - \varphi_m)^2(\varphi_v - \varphi_m) \right]. \tag{8}$$

As k increases within $\left[\bar{k}/4, \bar{k} \right]$, the term $(\phi - \tau_m(q^*(k)))(\varphi_v - q_i^*(k))$ continuously decreases while the term $(q_i^*(k) - \varphi_m)^2(\varphi_v - \varphi_m)$ continuously increases. Therefore, the derivative in Eq. (8) is decreasing in k as $\frac{\gamma}{\phi} \frac{\partial q_i^*(k)}{\partial k} > 0$ and $\frac{\partial^2 q_i^*(k)}{\partial k^2} < 0$. Hence, to show that $\frac{\partial W_v^*(k)}{\partial k} > 0$ for all $k \in \left[\bar{k}/4, \bar{k} \right]$, it is sufficient to show that $\frac{\partial W_v(k)}{\partial k}\big|_{k=\bar{k}} > 0$. Since by assumption $\phi > \gamma(\varphi_v - \varphi_m)^2$, I replace ϕ by $\gamma(\varphi_v - \varphi_m)^2$ and $q_i^*(\bar{k})$ by $\frac{\varphi_v + 3\varphi_m}{4}$ in Eq. (8) to obtain that

$$\left[\gamma(\varphi_v - \varphi_m)^2 - \tau_m \left(q_i^*(\bar{k}), \varphi_m \right) \right] (\varphi_v - q_i^*(\bar{k})) - 2\gamma \left(q_i^*(\bar{k}) - \varphi_m \right)^2 (\varphi_v - \varphi_m) > 0.$$

Therefore, the voter's welfare $W_v(k)$ is strictly increasing in k for every $k \in \left[\bar{k}/4, \bar{k} \right]$.

Consider now the case where the misreporting costs are relatively high, $k \geq \bar{k}$. I rewrite the welfare function in Eq. (6) by explicitly separating the expected gains from quality, i.e.,

$$W_v^*(k) = \left(\frac{\tau_m(q^*(k)) + \phi}{2\phi} \right) \left[-\gamma(\varphi_v - q_c^*(q_i^*(k)))^2 \right]$$
$$+ \left(1 - \frac{\tau_m(q^*(k)) + \phi}{2\phi} \right) \left[-\gamma(\varphi_v - q_i^*(k))^2 \right] + \frac{\phi^2 - \tau_m^2(q^*(k))}{4\phi}. \tag{9}$$

The threshold $\tau_m(q^*(k)) = \gamma \left(2\varphi_m - q_c^*(q_i(k)) - q_i^*(k) \right) \left(q_c^*(q_i(k)) - q_i^*(k) \right)$ is positive as $q_i^*(k) > q_c^*(q_i(k)) \geq \varphi_m$ for every finite $k \geq \bar{k}$. I write the derivative $\frac{\partial \tau_m(q^*(k))}{\partial k}$ as

$$\frac{\partial \tau_m(q^*(k))}{\partial k} = \gamma \left[\left(-\frac{\partial q_c^*(q_i^*(k))}{\partial k} - \frac{\partial q_i^*(k)}{\partial k} \right) \left(q_c^*(q_i^*(k)) - q_i^*(k) \right) \right.$$
$$\left. + \left(2\varphi_m - q_c^*(q_i^*(k)) - q_i^*(k) \right) \left(\frac{\partial q_c^*(q_i^*(k))}{\partial k} - \frac{\partial q_i^*(k)}{\partial k} \right) \right]$$
$$= \frac{\gamma}{\left(q_c^*(q_i^*(k)) - q_i^*(k) \right)} \left[\left(-\frac{\partial q_c^*(q_i^*(k))}{\partial k} - \frac{\partial q_i^*(k)}{\partial k} \right) \left(q_c^*(q_i^*(k)) - q_i^*(k) \right)^2 \right.$$
$$\left. + \tau_m(q^*(k)) \left(\frac{\partial q_c^*(q_i^*(k))}{\partial k} - \frac{\partial q_i^*(k)}{\partial k} \right) \right] < 0,$$

where we obtain $\frac{\partial \tau_m(q^*(k))}{\partial k} < 0$ because, for every finite $k \geq \bar{k}$, it is the case that $q_c^*(q_i^*(k)) < q_i^*(k)$, $\frac{\partial q_c^*(q_i^*(k))}{\partial k} > \frac{\partial q_i^*(k)}{\partial k} > 0$, $\tau_m(q^*(k)) > 0$, and $\frac{\partial q_c^*(q_i^*(k))}{\partial k} - \frac{\partial q_i^*(k)}{\partial k} = \frac{\hat{\xi}}{8\gamma k^2 (\varphi_v - \varphi_m) \sqrt{\hat{\xi}/k}} > 0$.

Since $\frac{\partial}{\partial k}\left(\frac{\tau_m(q^*(k))+\phi}{2\phi}\right) = \frac{1}{2\phi}\frac{\partial \tau_m(q^*(k))}{\partial k} < 0$, the probability that the challenger (incumbent) wins the election decreases (increases) as k increases. Both policies $q_i^*(k)$ and $q_c^*(q_i^*(k))$ increase with $k \geq \bar{k}$, with $\lim_{k\to\infty} q_i^*(k) = \lim_{k\to\infty} q_c^*(q_i^*(k)) = \varphi_v$. Since $\varphi_v > q_i^*(k) > q_c^*(q_i^*(k))$ for every finite $k \geq \bar{k}$, the voter always prefers policy $q_i^*(k)$ to $q_c^*(q_i^*(k))$. Moreover, the expected gains from quality are increasing in k since $\frac{\partial}{\partial k}\left(\frac{\phi^2-\tau_m^2(q^*(k))}{4\phi}\right) = -\frac{\tau_m(q^*(k))}{2\phi}\frac{\partial \tau_m(q^*(k))}{\partial k} > 0$. Therefore, as k increases, the voter has better policy proposals, a higher probability of implementing her favorite policy, and higher expected gains from quality. It follows that, for every finite $k \geq \bar{k}$, $\frac{\partial W_v^*(k)}{\partial k} > 0$. The proof concerning results about $W_v^*(k)$ is completed by noting that, from Eq. (6), we obtain $\lim_{k\to\infty} W_v^*(k) = \hat{W}_v = \phi/4$.

I now turn to the equilibrium persuasion rate $\chi(k)$. Proposition 2 shows that equilibrium policies differ for intermediate costs levels, and converge otherwise. Recall that on the equilibrium path there is full persuasion, meaning that $h(r^*(q^*(k))) = \tau_m(q^*(k))$ for every $k > 0$. As a result, the persuasion rate in the game with a pragmatic media is

$$\chi(k) = \frac{1}{2\phi}\left(\tau_m\left(q^*(k)\right) - \tau_v\left(q^*(k)\right)\right).$$

Policy convergence when $k \in \left(0, \bar{k}/4\right)$ and when $k \to \infty$ implies that $\tau_m\left(q^*(k)\right) = \tau_v\left(q^*(k)\right) = 0$, and thus the persuasion rate is zero in those cases. Proposition 2 also shows that, as k increases, equilibrium policies get further apart when $k \in \left(\bar{k}/4, \bar{k}\right)$, whereas they get closer to each other when $k > \bar{k}$. As the distance between equilibrium policies increases, we have that $\tau_m\left(q^*(k)\right) - \tau_v\left(q^*(k)\right)$ increases. As a result, we obtain $d\chi(k'')/dk'' > 0 > d\chi(k''')/dk'''$ for all $k'' \in \left(\bar{k}/4, \bar{k}\right)$ and $k''' > \bar{k}$. $\qquad\square$

A.3.2 Ideological Media

Consider the ideological media case, where $\xi(\theta, q) = |\tau_m(q) - \theta|$. The rest of this section proceeds by showing that higher costs levels can be associated with more misreporting and persuasion, and yet make the voter better off.

Proof of Proposition 3 From the results in Proposition 1, it follows that the equilibrium persuasion rate is zero when $k \to 0^+$ and $k \to \infty$, as equilibrium policies converge to φ_m and φ_v, respectively. That is, $\lim_{k\to 0^+} \chi(k) = \lim_{k\to\infty} \chi(k) = 0$. As a result, we obtain that $\lim_{k\to 0^+} W_v^*(k) = -\gamma(\varphi_v - \varphi_m)^2 + \phi/4$ and $\lim_{k\to\infty} W_v^*(k) = \phi/4$. Moreover, Proposition 1 shows that equilibrium policy proposals differ for sufficiently large but finite costs k. As a result, the equilibrium persuasion rate $\chi(\cdot)$ is strictly positive in the same cost range, as $h(r^*(q^*(k))) > \tau_v(q^*(k))$.

Next, I show that the equilibrium policies, voter's welfare, and persuasion rate are continuously increasing with respect to k. In the purely policy motivated media case (Sect. A.2.2), we have seen that $V_c(q_i, BR_c^L(q_i))$ is increasing in q_i. The same line of reasoning holds when the outlet is ideological. Moreover, a similar procedure shows that $V_c(q_i, BR_c^R(q_i))$ increases as q_i decreases. The functions h, l, r^*, τ_m, and τ_v are continuous with respect to their arguments. As a consequence, the best responses

BR_c^L and BR_c^R, and the payoff V_c are also continuous with respect to the costs k and policies q_i, q_c.

The incumbent's optimal policy $q_i^*(k)$ is set to minimize the challenger's gain from best responding. We have seen that higher q_i are associated with a higher $V_c(q_i, BR_c^L(q_i))$ and a lower $V_c(q_i, BR_c^R(q_i))$. When k is sufficiently large so that $q_i^*(k) > \varphi_m$, the optimal policy of the incumbent $q_i^*(k)$ must be such that $V_c(q_i^*(k), BR_c^L(q_i^*(k))) = V_c(q_i^*(k), BR_c^R(q_i^*(k)))$. Since the best responses and the payoffs V_c are continuous with respect to their arguments, it follows that $q_i^*(k)$ and $q_c^*(q_i^*(k), k)$ are both continuous with respect to k. As a result, also the voter's welfare $W_v^*(k)$ and persuasion rate $\chi(k)$ are continuous in k.

Finally, policy convergence to (φ_v, φ_v) as $k \to \infty$ means that the voter's equilibrium welfare eventually converges to $\phi/4$. Together with the observation that $W_v^*(k)$ is continuous in k, this convergence implies that, for every $\tilde{\epsilon} > 0$ small enough, there exists a finite $\tilde{k} > 0$ such that $|W_v^*(k') - \phi/4| < \tilde{\epsilon}$ for every finite $k' \geq \tilde{k}$. The proof is completed by setting $\tilde{k}$ such that $W_v^*(k) > -\gamma(\varphi_v - \varphi_m)^2 + \phi/4$ for every $k \geq \tilde{k}$. □

A.4 Influential News and Applications

Corollary A.1 *A sufficient condition on the state space ensuring the existence of equilibria as described in Propositions* 1 *and* 2 *is* $\phi \geq 3\gamma(\varphi_v - \varphi_m)^2$.

Proof Consider the sender-preferred equilibrium of $\hat{\Gamma}$ in Lemma 1 and the equilibrium policies in Proposition 2. In the game with a pragmatic media, we have that $q^*(k) = (\varphi_m, \varphi_m)$ when $k \in (0, \bar{k}/4)$. Suppose that the challenger deviates from the prescribed equilibrium strategy by proposing $q_c = \varphi_v$. If $\phi < r^*(\varphi_m, \varphi_v)$, then there is no report that can convince the voter to cast a ballot for the incumbent, and the deviation would be profitable. Therefore, to ensure the existence of an equilibrium as in Proposition 2, it is necessary that $\phi \geq r^*(\varphi_m, \varphi_v)$. Given that for q such that $q_j \in [\varphi_m, \varphi_v]$, $j \in \{i, c\}$, $\tau_v(q)$ is maximized when $q_i = \varphi_m$ and $q_c = \varphi_v$, the condition is also sufficient. By using $\tau_v(\varphi_m, \varphi_v) = \gamma(\varphi_v - \varphi_m)^2 = -\tau_m(\varphi_m, \varphi_v)$, we obtain that the condition is

$$\phi \geq \min\left\{\gamma(\varphi_v - \varphi_m)^2 + \frac{1}{2}\sqrt{\hat{\xi}/k}, \ 3\gamma(\varphi_v - \varphi_m)^2\right\}.$$

Consider now the same type of deviation in the game with an ideological media. Recall that, in this case, we have $\tau_m(\varphi_m, \varphi_v) < l(r^*(\varphi_m, \varphi_v))$ for every $k > 0$, and $l(r^*(\varphi_m, \varphi_v)) \downarrow \tau_m(\varphi_m, \varphi_v)$ as $k \to 0$ (this limit can be found by, e.g., applying l'Hôpital's rule). In equilibrium (Lemma 1), we have $r^*(\varphi_m, \varphi_v) - \tau_v(\varphi_m, \varphi_v) = \tau_v(\varphi_m, \varphi_v) - l(r^*(\varphi_m, \varphi_v))$, as the pooling report r^* must induce the expectation $\mathbb{E}_f[\theta \,|\, l(r^*) < \theta < r^*] = \tau_v(q)$, and the prior is uniform. By substituting $l(r^*(\varphi_m, \varphi_v))$ with $\tau_m(\varphi_m, \varphi_v)$, $\tau_m(\varphi_m, \varphi_v)$ with $-\tau_v(\varphi_m, \varphi_v)$, and $\tau_v(\varphi_m, \varphi_v)$ with $\gamma(\varphi_v - \varphi_m)^2$, we obtain that $\phi \geq 3\gamma(\varphi_v - \varphi_m)^2$ is a sufficient condition for the existence of the equilibria as in Proposition 1.   □

Proof of Corollary 1 In the absence of a media outlet, the median voter theorem holds and both candidates offer φ_v. The voter, being uninformed, cannot do better than select

candidates randomly given proposals $q = (\varphi_v, \varphi_v)$. Therefore, the voter's expected payoff without a media outlet is $-\gamma(\varphi_v - \varphi_v)^2 + \mathbb{E}_f[\theta] = 0$.

Consider first the ideological media case. From Proposition 3, we have that

$$\lim_{k \to 0^+} W_v^*(k) = \phi/4 - \gamma(\varphi_v - \varphi_m)^2 < \lim_{k \to \infty} W_v^*(k) = \phi/4,$$

where $\phi/4 > 0$. Since equilibrium policies converge to φ_v as $k \to \infty$ (Proposition 1), then there exists a k'' sufficiently high such that $W_v^*(k) > 0$ for every $k \geq k''$. Moreover, from the proof of Proposition 3 we have that equilibrium policies are continuous in k. As a result, if $\lim_{k \to 0^+} W_v^*(k) < 0$, there exists a k' sufficiently low such that $W_v^*(k) < 0$ for every positive $k < k'$. Consider now a pragmatic media. From Proposition 4 we have that the welfare of the voter is at its minimum for $k \in (0, \bar{k}/4]$. Moreover, $W_v^*(k)$ is continuous and increasing in k, with $W_v^*(k) = -\gamma(\varphi_v - \varphi_m)^2 + \phi/4$ for all $k \in (0, \bar{k}/4]$, and $\lim_{k \to \infty} W_v^*(k) = \phi/4 > 0$. As a result, if $-\gamma(\varphi_v - \varphi_m)^2 + \phi/4 < 0$, then there exists a $k' > \bar{k}/4$ such that $W_v^*(k) < 0$ for all $k \in (0, k')$ and $W_v^*(k) > 0$ for all $k > k'$.   □

Proof of Lemma 2 The proof follows directly from maximizing $\iota(k)$ with respect to k, where $q^*(k)$ is as in Proposition 1 for the ideological media case, and as in Proposition 2 for the instrumental media case. From the analysis of equilibria in the communication subgame and of the policy-making stage, we obtain that on the equilibrium path persuasion occurs in the set of states $(\tau_v(q^*(k)), h(r^*(q^*(k))))$. Moreover, we have seen that in the pragmatic media case there is full persuasion, that is, $h(r^*(q^*(k))) = \tau_m(q^*(k))$. As a result, we have that in the game with an ideological media $\iota(k) = \frac{1}{2\phi}(\phi - h(r^*(q^*(k))))$, whereas in the game with a pragmatic media $\iota(k) = \frac{1}{2\phi}(\phi - \tau_m(q^*(k)))$.

Consider the ideological media case. It follows from the proof of Proposition 1 that $q^*(0) = (\varphi_m, \varphi_m)$. In this case, we have $h(r^*(q^*(0))) = r^*(q^*(0)) = \tau_v(q^*(0)) = \tau_m(q^*(0)) = 0$, yielding $\iota(0) = 1/2$. Proposition 1 also tells us that for sufficiently high k there is policy divergence, thus $h(r^*(q^*(k))) > \tau_v(q^*(k))$ and persuasion occurs in equilibrium, yielding $\iota(k) < 1/2$. Therefore, $k = 0$ is a solution to the incumbent's problem. Consider now the pragmatic media case. Since $\tau_m(q^*(k)) > 0$ for every finite $k > \bar{k}/4$ and $\tau_m(q^*(k)) = 0$ for every $k \in [0, \bar{k}/4]$, it follows that $\iota(k)$ is maximized in $k \in [0, \bar{k}/4]$, where $\iota(k) = \frac{1}{2}$.

Finally, since $\lim_{k \to \infty} \tau_m(q^*(k)) = \lim_{k \to \infty} h(r^*(q^*(k))) = 0$, then $\lim_{k \to \infty} \iota(k) = 1/2$.   □

B Supplementary Appendix

B.1 Multiple media outlets

Proof of Corollary 2 To begin, I first look at the voter's beliefs given the outlets' strategies. The profile $\{r_j\}_M$ is off path either when reports are not all identical or when $\{r_j\}_M = \{r'\}_M$ for some $r' \in (r_\ell^*(q), h_\ell(r_\ell^*(q))]$. In the former case, the voter elects

the challenger as long as all reports are lower than or equal to $r_\ell^*(q)$; if instead some sender delivers a report that is greater than $r_\ell^*(q)$, then the voter elects the incumbent. In the latter case, the voter always elects the incumbent. The media outlets fully separate all states higher than $h_\ell(r_\ell^*(q))$ or lower than $r_\ell^*(q)$. Therefore, in these cases the voter fully learns the state. When all outlets deliver $r_\ell^*(q)$, the voter learns that the state is between $r_\ell^*(q)$ and $h_\ell(r_\ell^*(q))$. In this case, the voter is indifferent between the two alternatives, and splits indifference in favor of the outlets by electing the challenger.

I now look at the outlets' strategies given the voter's beliefs. When the state is strictly higher than $h_\ell(r_\ell^*(q))$, no individual outlet can change the outcome of the election by deviating from the prescribed strategy. Since all outlets are already reporting truthfully, no profitable individual deviation exists. When the state is lower than $r_\ell^*(q)$, all outlets report truthfully and their preferred candidate is elected. Therefore, no profitable individual deviation exists. When the state is in the set $\left(r_\ell^*(q), h_\ell(r_\ell^*(q))\right)$, all outlets are prescribed to deliver $r_\ell^*(q)$ at a cost $k(r_\ell^*(q) - \theta)^2$. Since $h_\ell(r_\ell^*(q)) \leq \tau_\ell(q)$ and $\tau_\ell(q) \leq \tau_j(q)$ for all $j \in M$, all outlets prefer the challenger over the incumbent when $\theta \in \left(r_\ell^*(q), h_\ell(r_\ell^*(q))\right)$. After observing $\{r_\ell^*(q)\}_M$, the voter elects the challenger, and thus no outlet can profitably deviate by reporting some $r_j < r_\ell^*(q)$. If even one outlet deviates by reporting some $r_j > r_\ell^*(q)$, then the voter would elect the incumbent, making this deviation never profitable. It follows that the strategies and beliefs in Corollary 2 constitute an equilibrium of the communication subgame $\hat{\Gamma}_M$. $\qquad\square$

B.2 Equilibrium of the Communication Subgame

Lemma B.1 *The sender-preferred generic equilibrium of $\hat{\Gamma}$, where $\lambda = \tau_v$, is also the unique perfect sequential equilibrium* (Grossman and Perry 1986) *of $\hat{\Gamma}$.*

Proof Consider an equilibrium (ρ, p) of the communication subgame. Define the set K containing all types in Θ that are better off relative to the proposed equilibrium when they deliver an off path report r', provided that beliefs are p' rather than p. Say that beliefs p' are consistent if, following r', they are the conditional distribution of the outlet's type given that the outlet is drawn from the set K. An equilibrium (ρ, p) fails to be perfectly sequential if there exist such a set of types K and consistent beliefs p'. A formal definition of perfect sequential equilibrium is provided by (Grossman and Perry 1986).

Since the concept of perfect sequential equilibrium (PSE) is stronger than the Intuitive Criterion, every PBE of the communication subgame that is eliminated by the Intuitive Criterion is not perfectly sequential. Consider now a generic equilibrium of $\hat{\Gamma}$ with $\lambda \in [\tau_v, \zeta]$, as in Proposition A.1. I define $K(r, \lambda)$ as the set of types that would gain by delivering an off-path report r were the voter reply by electing the incumbent rather than the challenger. Proposition A.1 tells us that off path reports are in the set $(l(\hat{r}(\lambda)), \hat{r}(\lambda))$, where $\hat{r}(\lambda)$ is defined in point i) of the same proposition. Formally, by the definition of lowest misreporting type $l(r)$ and the properties of $C(\cdot)$, we obtain that $K(r, \lambda) = (l(r), \vartheta(r, \lambda))$, where

$$\vartheta(r, \lambda) = \left\{\theta' \mid C(r, \theta') = C(\hat{r}(\lambda), \theta') \text{ and } r < \theta' < \hat{r}(\lambda)\right\}.$$

Notice that $\hat{r}(\tau_v) \in (l(\hat{r}(\lambda)), \hat{r}(\lambda))$ for every $\lambda \in (\tau_v, \zeta]$, and thus $\hat{r}(\tau_v)$ is always off-path in these equilibria. Given that $\mathbb{E}_f[\theta \mid \theta \in (l(\hat{r}(\tau_v)), \hat{r}(\tau_v))] = \tau_v$ (see Proposition A.1), it follows that $\mathbb{E}_f[\theta \mid \theta \in (l(\hat{r}(\tau_v)), \vartheta(\hat{r}(\tau_v), \lambda))] > \tau_v$. Suppose that, in a generic equilibrium of $\hat{\Gamma}$ with $\lambda \in (\tau_v, \zeta]$, upon observing the off-path report $\hat{r}(\tau_v)$ the voter conjectures that such a report has been delivered by types of sender in the set $K(\hat{r}(\tau_v), \lambda)$. The voter's updated "consistent" beliefs p_K are the conditional distribution of the outlet's type given that $\theta \in K(\hat{r}(\tau_v), \lambda)$. That is, p_K is a uniform distribution with full support in $K(\hat{r}(\tau_v), \lambda)$. Given beliefs p_K, the voter casts a ballot for the incumbent, as $\mathbb{E}_{p_K}[\theta] = \mathbb{E}_f[\theta \mid \theta \in (l(\hat{r}(\tau_v)), \vartheta(\hat{r}(\tau_v), \lambda))] > \tau_v$. This makes a deviation to $\hat{r}(\tau_v)$ profitable only for types $\theta \in K(\hat{r}(\tau_v), \lambda)$. Therefore, all generic equilibria of $\hat{\Gamma}$ with $\lambda \in (\tau_v, \zeta]$ are *not* perfectly sequential. Finally, consider the generic equilibrium with $\lambda = \tau_v$. In this case, every off-path report $r' \in (l(\hat{r}(\tau_v)), \hat{r}(\tau_v))$ induces consistent beliefs such that $\mathbb{E}_{p_K}[\theta] = \mathbb{E}_f[\theta \mid \theta \in (l(r'), \vartheta(r'), \lambda)] < \tau_v$, and the voter casts a ballot for the challenger after observing r'. No type of sender would benefit from delivering any off-path report $r' \in (l(\hat{r}(\tau_v)), \hat{r}(\tau_v))$, and thus this equilibrium is perfectly sequential. Therefore, the generic equilibrium of $\hat{\Gamma}$ with $\lambda = \tau_v$ is the only perfect sequential equilibrium of $\hat{\Gamma}$. □

Lemma B.2 *The undefeated (Mailath et al. 1993) generic equilibrium of $\hat{\Gamma}$ is unique and it has $\lambda = \tau_v$.*

Proof Denote the set of generic equilibria of $\hat{\Gamma}$ with $GE(\hat{\Gamma})$ (see Proposition A.1). With a slight abuse of notation, say that $u_m(\rho, p, \lambda, \theta)$ denotes the media outlet's payoff in the generic equilibrium (ρ, p) with parameter λ and when the state is θ. From Mailath et al. (1993), $(\rho, p) \in GE(\hat{\Gamma})$ defeats $(\rho', p') \in GE(\hat{\Gamma})$ if there exists a report $r \in \Theta$ such that (i) $\rho'(\theta) \neq r$ for every $\theta \in \Theta$, and $\kappa(r) \equiv \{\theta \in \Theta \mid \rho(\theta) = r\} \neq \varnothing$; (ii) for every $\theta \in \kappa(r)$, $u_m(\rho, p, \lambda, \theta) \geq u_m(\rho', p', \lambda, \theta)$, with the inequality being strict for some $\theta \in \kappa(r)$; (iii) there is some $\theta \in \kappa(r)$ such that $p'(\theta \mid r)$ is different from the conditional probability that the state is in $\kappa(r)$.

Consider now the generic equilibrium of $\hat{\Gamma}$ with $\lambda = \tau_v$, and notice that $\hat{r}(\tau_v)$ is off-path in every other generic equilibrium of $\hat{\Gamma}$ with $\lambda' \in (\tau_v, \zeta]$. For every $\theta \in (l(\hat{r}(\tau_v)), \hat{r}(\tau_v))$, we have that $u_m(\cdot, \lambda = \tau_v, \theta) = \xi(\theta, q) - kC(\hat{r}(\tau_v), \theta) > u_m(\cdot, \lambda', \theta)$ as either $u_m(\cdot, \lambda', \theta) = 0$ or $u_m(\cdot, \lambda', \theta) = \xi(\theta, q) - kC(\hat{r}(\lambda'), \theta)$. Finally, $\mathbb{E}_f[\theta \mid \theta \in \kappa(\hat{r}(\tau_v))] = \tau_v$, and therefore $p'(\theta \mid \hat{r}(\tau_v))$ must differ from the conditional probability of $\theta \in \kappa(\hat{r}(\tau_v))$ for the voter to select the challenger upon observing $\hat{r}(\tau_v)$ in generic equilibria with $\lambda' \neq \tau_v$. Hence, the generic equilibrium of $\hat{\Gamma}$ with $\lambda = \tau_v$ defeats every other generic equilibria of $\hat{\Gamma}$.

Reports in $(l(\hat{r}(\tau_v)), l(\hat{r}(\lambda')))$ are the only reports that are on-path in a generic equilibrium of $\hat{\Gamma}$ with $\lambda' \in (\tau_v, \zeta]$ but not when $\lambda = \tau_v$. In all these generic equilibria, upon observing a $r' \in (l(\hat{r}(\tau_v)), l(\hat{r}(\lambda')))$ the voter casts a ballot for the challenger. Therefore, no generic equilibrium of $\hat{\Gamma}$ with parameter λ' can defeat the one with $\lambda = \tau_v$. Hence, the generic equilibrium of $\hat{\Gamma}$ with parameter $\lambda = \tau_v$ is the only undefeated generic equilibrium of the communication subgame. □

Corollary B.1 *The set of equilibrium payoffs that the voter can obtain in a PBE robust to the Intuitive Criterion is $\mathcal{W}(k) = \left[W_v^*(k), \hat{W}_v\right]$, where $W_v^*(k)$ is as in Eq. (6) and $\hat{W}_v = \phi/4$ is the full-information welfare.*

Proof By definition, Eq. (6) describes the lowest payoff the voter can receive in a PBE robust to the Intuitive Criterion. As assumed in Appendix A.2.1, suppose that the challenger selects the voter's least preferred policy when indifferent, and consider a generic equilibrium of $\hat{\Gamma}$ as in Proposition A.1. By the continuity of $l(r)$ and $h(r)$ with respect to r, and of $r^*(\lambda)$ with respect to λ, we obtain that the voter's equilibrium welfare is continuously (weakly) increasing in $\lambda \in [\tau_v(q), \zeta]$: for higher λ, the set of states in which persuasion occurs (weakly) shrinks and both the incumbent and the challenger's policies get (weakly) closer to the voter's bliss policy φ_v. When $\lambda = \zeta$ there is no persuasion at all, and the voter always votes for her preferred candidate *as if* under complete information. Since the media outlet has no persuasive power, the median voter theorem holds and both candidates propose φ_v. In this case the voter's welfare is $\hat{W}_v = \phi/4$, and therefore in a PBE robust to the Intuitive Criterion the voter can obtain any payoff in the set $\left[W_v^*(k), \hat{W}_v \right]$. □

B.3 Simultaneous Policy-making and Information Withholding

Lemma B.3 *Suppose that candidates propose policies simultaneously and the media is pragmatic. Then, if $k \leq \bar{k}/4$ there is an equilibrium where both policies converge to φ_m.*

Proof Consider a variation of the model in Sect. 3 such that candidates propose policies simultaneously rather than sequentially. Suppose that there is an equilibrium where $q' = (\varphi_m, \varphi_m)$, and notice that $\tau_v(q') = \tau_m(q') = V_j(q') = 0$, $j \in \{i, c\}$. A deviation by the challenger to some $q_c > \varphi_m$ cannot be profitable if $V_c(\varphi_m, q_c) = l(r^*(\varphi_m, q_c)) \leq 0$, where $l(r^*(\varphi_m, q_c)) = \max \left\{ r^*(\varphi_m, q_c) - \sqrt{\hat{\xi}/k}, \ \tau_m(\varphi_m, q_c) \right\}$ and

$$r^*(\varphi_m, q_c) = \min \left\{ \tau_v(\varphi_m, q_c) + \tfrac{1}{2}\sqrt{\hat{\xi}/k}, \ 2\tau_v(\varphi_m, q_c) - \tau_m(\varphi_m, q_c) \right\}.$$

Since for a $q_c \in (\varphi_m, \varphi_v)$ we have that $\partial \tau_m(\varphi_m, q_c)/\partial q_c < 0 < \partial \tau_v(\varphi_m, q_c)/\partial q_c$, and $\partial \tau_v(\varphi_m, q_c)/\partial q_c = 0$ when $q_c = \varphi_v$, the challenger's payoff $V_c(\varphi_m, q_c)$ has a maximum either at $q_c = \varphi_m$ or at $q_c = \varphi_v$. The condition $V_c(\varphi_m, \varphi_v) \leq 0$ gives us $k \leq \hat{\xi}/[4\gamma^2(\varphi_v - \varphi_m)^4] = \bar{k}/4$. When $k \leq \bar{k}/4$, there is an equilibrium where policies converge to (φ_m, φ_m). □

Lemma B.4 *Suppose that candidates propose policies simultaneously, and the media is pragmatic. Then, there is no pure strategy equilibrium in the policy-making stage when $k \geq \bar{k}$, with k finite.*

Proof Suppose that candidates propose policies simultaneously, the media is pragmatic, and $k \geq \bar{k}$. Since candidates are symmetric, their best response functions are symmetric as well. From Proposition A.2 the best response of the challenger to a q_i is either φ_v or $q_i - \eta(k)$. Since $q_j - \eta(k)$ is always below the q_j line for every finite $k \geq \bar{k}$, a pure strategy equilibrium of the policy-making stage must have one of the two

candidates proposing φ_v. Suppose that $q_i = \varphi_v$, and therefore $BR_c(\varphi_v) = \varphi_v - \eta(k)$. From Proposition A.2 we obtain that $BR_i(BR_c(\varphi_v)) = \varphi_v$ only if $\varphi_v - \eta(k) \leq \varphi_v + \eta(k) - \sqrt[4]{\hat{\xi}/\gamma^2 k}$. By rearranging and plugging $\eta(k) = \sqrt{\hat{\xi}/k} / [4\gamma(\varphi_v - \varphi_m)]$, we obtain $\sqrt[4]{\hat{\xi}/\gamma^2 k} \leq \sqrt{\hat{\xi}/k} / 2\gamma(\varphi_v - \varphi_m)$. This last condition is not satisfied at $k = \bar{k}$, and thus it is not for any finite $k > \bar{k}$. □

Lemma B.5 *There is no perfect sequential equilibrium of the communication subgame where the outlet achieves persuasion by withholding information at a cost $\omega > 0$.*

Proof Consider a variant of the baseline model where the outlet can withhold information by delivering an empty report $\varnothing$ at a cost $\omega > 0$. I use "silence" and "withholding information" interchangeably. Suppose that there is a perfect sequential equilibrium (ρ, p) where $\varnothing$ is on path with $\beta(\varnothing, q) = i$. The media outlet is either ideological or pragmatic. Consider the case where $\tau_m(q) < \tau_v(q)$. The pooling report $r^*(q)$ is defined as in Lemma 1.

In every perfect sequential equilibrium of the augmented game where withholding information is possible, the report $r^*(q)$ must be on path. Suppose not. Equilibrium beliefs p must assign $\beta(r^*(q), q) = c$, for otherwise outlet's type $\theta = r^*(q)$ would be strictly better off by reporting truthfully. I now check if these beliefs are consistent with the perfect sequential equilibrium concept. Consider alternative beliefs p' assigning $\beta(r^*(q), q) = i$. Denote with K the set of types that would be better off relative to the proposed equilibrium when reporting $r^*(q)$ under beliefs p'. Types $\theta \leq \tau_m$ do not belong to K. If some type $\theta' \in (\tau_m(q), r^*(q))$ gains by reporting $r^*(q)$ under beliefs p', then also all types $\theta \in (\theta', r^*(q)]$ do so. From the definition of $l(r)$, the set K includes $\left[\hat{\theta}, r^*(q)\right]$ for some $\hat{\theta} \in (\max\{l(r^*(q)), \tau_m(q)\}, r^*(q))$. Say that beliefs p' are consistent in the sense that $p'(\theta \mid r^*(q))$ is the conditional distribution of the outlet's type given that the outlet is drawn from the set K. Then, since $\mathbb{E}_f[\theta \mid \theta \in (\max\{l(r^*(q)), \tau_m(q)\}, r^*(q))] = \tau_v(q)$ (Lemma 1), it follows that $\mathbb{E}_{p'}[\theta \mid \theta \in K] = \mathbb{E}_f[\theta \mid \theta \in K] \geq \tau_v(q)$, and thus we have that $\beta(r^*(q), q) = i$ under p'. Given that such a set K and consistent beliefs p' exist, an equilibrium cannot be perfectly sequential if $r^*(q)$ is off path.

Therefore, $r^*(q)$ is on path, and beliefs must assign $\beta(r^*(q), q) = i$. To see why, suppose instead that $r^*(q)$ is on path but $\beta(r^*(q), q) = c$. For on path beliefs to be such that $\beta(r^*(q), q) = c$, it must be that $\rho(\theta, q) = r^*(q)$ for some $\theta < \tau_v(q)$. However, the report $r^*(q)$ is strictly dominated by truthful reporting for all $\theta \in [\tau_m(q), \tau_v(q)]$. Moreover, Lemma A.3 rules out the possibility that $\rho(\theta, q) = r^*(q)$ for some $\theta < \tau_m(q)$. As a result, $r^*(q)$ cannot be delivered by the outlet when $\theta < \tau_v(q)$, contradicting that $\beta(r^*(q), q) = c$.

Define by $\tilde{\theta}$ the state $\tilde{\theta} < r^*(q)$ such that $kC(r^*(q), \tilde{\theta}) = \omega$. Given that $\beta(r^*(q), q) = i$ and $\beta(\varnothing, q) = i$, in this equilibrium types $\theta \in (\max\{\tilde{\theta}, \tau_m(q)\}, r^*(q)]$ do not withhold information, as they are strictly better off by reporting $r^*(q)$ than by delivering $\varnothing$. From the proof of Lemma A.5 we obtain that all types $\theta \geq r^*(q)$ report truthfully and induce the election of the incumbent at no cost.[59] Define the set of all

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[59] Lemmata A.3 and A.5 use the Intuitive Criterion test. Since the notion of perfect sequential equilibrium is more restrictive than the Intuitive Criterion, the lemmata can be applied without loss.

types that withhold information with $S := \{\theta \in \Theta \mid \rho(\theta, q) = \varnothing\}$. It must be that $\rho(\theta, q) \neq \varnothing$ for every $\theta \leq \tau_m(q)$, as the outlet is strictly better off by reporting truthfully in those states. Therefore, $\inf S \geq \tau_m(q)$ and, to have $\beta(\varnothing, q) = i$, beliefs p must be such that $\mathbb{E}_p[\theta \mid \theta \in S] \geq \tau_v(q)$. Hereafter, I focus on the cases where $\tilde{\theta} \geq \tau_v(q)$, for otherwise we would get $\beta(\varnothing, q) = c$. The set of types that stay silent in a perfect sequential equilibrium is $S \subseteq \left(\tau_m(q), \tilde{\theta} \right]$.

Since $\mathbb{E}_f[\theta \mid \theta \in (\max\{l(r^*(q)), \tau_m(q)\}, r^*(q))] = \tau_v(q)$ (Lemma 1) and $\tilde{\theta} < r^*(q)$, it follows that $\mathbb{E}_f \left[\theta \mid \theta \in \left(\tau_m(q), \tilde{\theta} \right] \right] < \tau_v(q)$. Hence, it must be that $\rho(\theta', q) \neq \varnothing$ for some $\theta' \in (\tau_m(q), \tau_v(q)]$ to have $\beta(\varnothing, q) = i$. Recall that, given the proofs in Appendix A.1 leading to Proposition A.1, we have that in equilibrium $\beta(r, q) = c$ for all $r < r^*(q)$. By definition of lowest misreporting type (see Eq. (1)), and since $kC(r^*(q), l(r^*(q))) > \omega = kC \left(r^*(q), \tilde{\theta} \right)$, we obtain that, when $\theta \in \left(l(r^*(q)), \tilde{\theta} \right)$ and $\beta(r^*(q), q) = \beta(\varnothing, q) = i$, the outlet prefers to deliver $\varnothing$ than to report $r^*(q)$. Moreover, in the same set of states, the outlet prefers to deliver $\varnothing$ than to report truthfully, as $\beta(\theta, q) = c$. For those types of media outlet, there are no reports cheaper than $r^*(q)$ that can yield i. As a result, we obtain that $\rho(\theta, q) = \varnothing$ for all $\theta \in \left(l(r^*(q)), \tilde{\theta} \right)$. Since $l(r^*(q)) < \tau_v(q) \leq \tilde{\theta} < r^*(q)$, and $\mathbb{E}_f[\theta \mid \theta \in (\max\{l(r^*(q)), \tau_m(q)\}, r^*(q))] = \tau_v(q)$, it follows that $\mathbb{E}_f \left[\theta \mid \theta \in \left(l(r^*(q)), \tilde{\theta} \right) \right] < \tau_v(q)$. Since $\inf S \in [\tau_m(q), l(r^*(q))]$, we cannot have $\mathbb{E}_p[\theta \mid \theta \in S] \geq \tau_v(q)$. As a result, $\beta(\varnothing, q) = c$, contradicting that $\beta(\varnothing, q) = i$.

The proof is analogous for the case $\tau_m(q) > \tau_v(q)$. To conclude, there is no perfect sequential equilibrium where the outlet achieves persuasion by withholding information when doing so comes at a positive cost, no matter how small. $\qquad\square$

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