Informative Campaigns, Overpromising, and Policy Bargaining

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Abstract

What is the relationship between policy positions taken in campaigns and those proposed in bargaining when the final policy outcome depends on other political actors? Why do candidates sometimes advocate policies in their campaigns that are unlikely or impossible to pass given the preferences of other actors in the government? We analyze a model in which candidates make non-binding policy platform announcements and then bargain with a veto player over the final policy if they take office. In the model, a candidate has private information that is related to the policy preferences of a key citizen group and engages in bargaining with a veto player who is responsive to this information. When the citizen's group sometimes interprets campaign promises naively, elections are more likely to allow information revelation. Furthermore, in this case, politicians overpromise: the politician's platform is outside of the range of feasible bargaining outcomes.

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The Democratic Presidential Primary of 2020 was seen by many observers as a clash between progressives and moderates, with candidates most clearly identified by their positions on health care reform. The left-most candidates supported Medicare for All—a universal health care system that would have eliminated private insurance—while the moderate candidates advocated a public option that would compete with private plans in the marketplace (Goodnough and Gabriel, 2019). Alexandria Ocasio-Cortez, a Democratic Representative from New York, vocal advocate of Medicare for All, and surrogate for one of the progressive candidates, stated "A President can't wave a magic wand and pass any legislation they want.... The worst-case scenario? We compromise deeply and we end up getting a public option. Is that a nightmare? I don't think so" (Rummler, 2020).

These comments by Representative Ocasio-Cortez raise several issues that deserve theoretical attention. First, when politicians decide what policy positions to run on during an election they may think ahead to the policy bargaining they will have to conduct with other political actors should they win office. Second, some politicians find it advantageous to run on positions that are more extreme than what they believe they will actually achieve through the political bargaining process. How might positions taken during the campaign affect what is possible in political bargaining? Might politicians sometimes need to advocate extreme positions that are infeasible as bargaining outcomes to get final outcomes closer to their preferred policies?

We provide some answers to both of these questions by analyzing a model of non-binding campaign promises and policy bargaining. A politician with information about key constituents' preferences over some policy issue takes a public position on that issue during the campaign. If that politician wins the election, then they make a proposal regarding which policy to implement that is subject to approval of a veto player (e.g., a pivotal Senator or other political actor). The veto player is assumed to be responsive to information that also affects the key constituents' preferences. Therefore, campaign promises may affect bargaining outcomes if they reveal information about these constituents' preferences.

We analyze the model under two different assumptions. In the model, campaign announcements may affect bargaining outcomes by revealing information about constituents' preferences. To see why, consider a simple stylized example using the healthcare policy debate. Suppose that a candidate, by virtue of going out and talking to a lot of constituents, has a good understanding of whether a particular group of citizens tend to prefer extreme changes to healthcare policy (Medicare for All) or a more moderate position (public option). The candidate themself is known to prefer the extreme position. Suppose that a veto player in the Senate is initially predisposed toward a moderate position but is persuadable if it turns out that this group of voters supports the extreme position. If the candidate were to speak directly to the veto player after taking office, there would be a credibility problem: the candidate would always want the veto player to believe that voters supported the extreme position, and so the veto player should not believe anything the candidate says. Elections, however, provide a check on the candidate's incentive to exaggerate: if the candidate tries to exaggerate and key voters worry that the veto player will believe the exaggeration, then this group of voters might conclude that the resulting bargaining outcome would be more extreme than they can tolerate, and might choose not to support the candidate. Under some conditions, this is enough of a check that campaign platforms can credibly reveal private information about constituents' preferences.

The logic described above only works to the extent that this key group of voters chooses their support for the candidate in a way that reveals their private information. We show that, in a standard model, this limitation is significant in the sense that it implies that the candidate can typically only reveal information when the voter group would have revealed it anyway. However, we consider a realistic change to the standard model: we consider that the group of voters may sometimes interpret campaign announcements literally and treat them like binding promises of a final policy outcome. We call such groups *credulous*, and show that the existence of credulous citizen groups expands the set of circumstances under which campaign announcements are informative. Furthermore, we show that, in a range of circumstances, equilibria supported by credulous citizen groups *must* involve campaign announcements that are more extreme than any feasible bargaining outcome.

We contribute to existing theoretical work in political science in several ways. First, we add to theoretical work in which voter preferences are communicated to politicians. The literature considers how politicians might learn about voter preferences from voting outcomes themselves (Meirowitz and Shotts, 2009; Myatt, 2017) or mobilization (Gause, 2022; Hill, 2022) in order to better respond to public opinion. We consider the behavior of a politician who may have private information about some constituents' preferences relative to other politicians, perhaps as a result of constituent service or activist work. Our results emphasize how the electoral process may enhance the credibility of statements about voter preferences from politicians who may otherwise be tempted to exaggerate. Electoral mechanisms also increase the credibility of policy statements in Schnakenberg and Turner (2021). Our model is also similar to that of Meirowitz and Shotts (2009) in that voters may consider the impact of their vote on the beliefs of politicians when choosing between candidates.

Second, we contribute to the literature on communication in electoral campaigns. One part of the literature considers whether cheap talk can be informative in elections (Alesina, 1988; Harrington Jr, 1992). Banks (1990) shows that high costs of lying in electoral campaigns might prevent some candidates from pandering to the moderate positions. Callander and Wilkie (2007) and Kartik and McAfee (2007) both show that the existence of candidates who engage in cheap talk during the electoral competition might reveal information about other candidates who do not. Panova (2017) shows that the expected benefit from reelection can make cheap talk informative in elections and can partially bind the candidate to their cheap talk once they get elected. Schnakenberg (2016) shows that cheap talk in elections featuring a multidimensional policy space can be partially informative by revealing the direction of the candidates' policy preferences while retaining information on who is more extreme. Kartik and Van Weelden (2019) show that cheap talk in election campaigns can reveal information about candidates' policy preferences and how the candidates will behave after getting elected in cases when candidates have a temptation to pander. Though these works focus on communication of politicians' preferences to voters, we focus on a different way that electoral statements might be informative: by revealing information about constituent preferences to other political actors.

Third, our model relates to empirical work on the relationship between campaign promises and real policy outcomes. With a laboratory experiment, Woon and Kanthak (2019) shows that candidates are induced to lie in their campaign promises in some election settings. However, different studies have shown how political communication between politicians and the public are closely related to the policy outcomes to some extent in real life. Both Grimmer (2013) and Sulkin (2011) show that the communication between legislators and their constituents can predict the legislators' policy priorities after they get elected to office. Other works show that, more often than not, campaign promises in policy areas such as environmental protection policy (Ringquist and Dasse, 2004) and education policy (Marschall and McKee, 2002) are kept after candidates get elected. Our model focuses on when politicians might *overpromise*. That is, politicians may accurately convey policy priorities but make statements suggesting they can achieve outcomes that are not feasible bargaining outcomes. The model is also related to empirical work by Meisels (2023) comparing campaign positioning (i.e. campaign statements) to revealed preferences in office (e.g. roll call votes).

Fourth, our analysis is related to prior work analyzing the consequences of the fact that a single representative cannot fully control the outcome on campaign platforms. Patty and Penn (2019) show that this can lead voters to prefer candidates with more extreme platforms. These results are driven by the fact that candidates do not control the distribution of agenda items they may decide over. Similarly, Kedar (2005) shows that the multiparty bargaining process leads voters to prefer parties with extreme positions to compensate for the compromise from the negotiation. The mechanism in this paper is very different since we are focused on what information is transmitted by non-binding platform announcements.

Fifth, our work extends the literature on bargaining with a veto player. Several studies in the literature have examined how the bargaining process between the proposer and the veto player affects the policy outcome. For example, Romer and Rosenthal (1979) illustrates how the veto power of bureaucratic threats can result in local expenditures that are larger than desired by the median voter. On the other hand, scholars have explored whether the proposer can leverage its private information on its type to compromise its proposal (Matthews, 1989), or persuade the veto player to agree with the outcome that is optimal for the proposer (Kim, Kim and Van Weelden, 2023). While our model shares similarities with these works, we differ by focusing a particular application without commitment.

Finally, other work considers credulity as a behavioral characteristic of interest in political economy models. Prior work analyzes sender-receiver games in which the receiver may naively trust the sender's messages and show how this can increase information transmission (Ottaviani and Squintani, 2006; Kartik, Ottaviani and Squintani, 2007; Chen, 2011). Little (2017) introduces credulous citizens into a model of propaganda, and shows how rational citizens sometimes imitate the behavior of credulous ones due to coordination incentives. Our paper shows how creduility on the part of the group sometimes enhances information transmission from the candidate to the veto player compared to the same situation with a fully rational group.

1 The model

Let $X = \mathbb{R}$ denote the one-dimensional policy space. There is a status quo policy $q > 0$, which we think of as a policy that is in place under an incumbent politician. The players are the Challenger (C), a Veto player (V), and a citizen Group (G).[1] A state $\omega \in \{\omega^L, \omega^R\}$ determines the optimal policy for the Group, with $\omega^L < \omega^R < 0$. This information is known to the Challenger and to the Group but not to the Veto player. Our interpretation of this is that the Challenger has a close relationship to the Group and therefore has information about the preferences of Group members, facts on the ground that affect the Group, or internal dynamics within the Group that the Veto player does not have. For instance, if the Challenger is a labor-friendly candidate and the Group is a labor union, the Challenger may be in touch with labor issues in a way that the Veto player (say, the median Senator) is not. Though the Veto player does not know the value of ω, the distribution

[1] The interpretation of the Group can be broad, which could be the electorate, members of a key interest group such as a labor union, and so on.

of ω is common knowledge, with $\Pr[\omega = \omega_L] = p \in (0,1)$.

Elections and policymaking proceed as follows. First, the Challenger announces a policy platform $x_C \in X$. Next, the Group chooses whether to support the Challenger or not. We assume that the Challenger gains office if and only if it enjoys the support of the Group. Finally, a policy is chosen in the following way: if the Challenger is not elected, the policy is q. If the Challenger is elected, it makes a take-it-or-leave-it offer $y \in X$ which the Veto player can choose to accept or reject. If the proposal is rejected, the final policy is q; otherwise the final policy is y.

Preferences and behavioral types The preferences of the players are as follows. The Group's preferences are represented by the utility function

$$u_G(x, \omega) = -|\omega - x| \tag{1}$$

where $x \in X$ is the final policy. We assume that, with an exogenous probability $\lambda \in [0,1]$, the Group is *credulous*. Though rational Groups form expectations by anticipating the equilibrium response of the Veto player and Challenger in policy bargaining, credulous Groups naively assume that the Challenger's announced policy will become law if the Challenger wins. Thus, credulous Groups simply compare the announced platform x_C to q and choose the Challenger if x_C is preferred. The Challenger and Veto player do not know whether the Group is credulous, but the value of λ is common knowledge.

The Veto player cares about policy but is also responsive to the state. We represent this idea by writing the Veto player's ideal point as $(1-\alpha)0 + \alpha\omega$ or $\alpha\omega$. That is, the Veto player's ideal point is a convex combination of their own initial ideal point of zero and the state. The parameter $\alpha \in (0,1)$ then represents the weight that the Veto player places matching the state versus satisfying their own idiosyncratic policy preferences. Thus, the Veto player's utility function is

$$u_V(x, \omega) = -|\alpha\omega - x|. \tag{2}$$

Of course, the Veto player may not know the true value of ω, so therefore she will maximize expected utility with respect to their beliefs about ω.

The Challenger is motivated by policy preferences that are independent of the state. The Challenger's ideal point is $z_C < 0$ and their preferences are represented by

$$u_C(x) = -|z_C - x|.$$

We assume that z_C is common knowledge and that $z_C < 2\alpha\omega^L - q < 0$. This restriction amounts to an assumption that the Challenger's ideal policy is always to the left of the left-most feasible policy, so when the Challenger is in office he is always constrained by the need to gain approval from the Veto player.

Solution concept Our equilibrium solution concept is similar to sequential equilibrium (Kreps and Wilson, 1982) with the exceptions that the credulous Group takes platform announcements literally and that the "trembles" used to define consistent beliefs are slightly modified to account for the Challenger's infinite action set.

An assessment is $(\sigma, \mu) = ((\sigma_C^1, \sigma_G, \sigma_C^2, \sigma_V), \mu)$ where $\sigma_C^1 : \{\omega^L, \omega^R\} \to \Delta(X)$ maps the Challenger's information about ω into probability distributions over Challenger campaign announcements in X, $\sigma_G : X \times \{\omega^L, \omega^R\} \to [0,1]$ maps information about ω and Challenger announcements into probabilities of the Group supporting the Challenger, $\sigma_C^2 : \{\omega^L, \omega^R\} \times X \to \Delta(X)$ maps prior campaign announcements and information about ω into proposals conditional on the Challenger winning, and $\sigma_V : X \times X \to [0,1]$ maps announcements and proposals into probabilities of accepting a proposal conditional on the Challenger winning. Finally $\mu : X \times X \to [0,1]$ gives the Veto player's belief that $\omega = \omega^L$ given a campaign announcement and proposal.

An equilibrium is an assessment for which:

1. σ_V assigns probability 1 to accepting a proposal that gives her strictly higher expected utility under beliefs μ than rejecting the proposal in favor of policy q, and assigns probability 0 to accepting a proposal that gives her strictly lower expected utility under μ than keeping q.

2. σ_C^1 and σ_C^2 maximize C's expected utility given the strategies of G and V

3. When the group G is not credulous, they follow σ_G which elects the Challenger with probability 1 if doing so gives G higher expected utility than leaving q in place given the strategies of the other players, and elects the Challenger with probability 0 if doing so gives G strictly lower expected utility than leaving q in place given the strategies of the other players.

4. The Veto player's beliefs (σ, μ) satisfies consistency in the following sense. We call a strategy completely mixed if it assigns positive probability to any non-empty open set of actions.[2] Then (σ, μ) is consistent if there is a sequence of completely mixed strategies $\sigma^k \to \sigma$ resulting in beliefs μ^k such that each μ^k follows Bayes' rule and $\mu^k \to \mu$.

The consistency condition for beliefs is stronger than what is required for perfect Bayesian equilibrium, requiring not only that beliefs are consistent with Bayes rule on the path of play but that all beliefs are consistent with a limit of Bayesian beliefs for a sequence of fully mixed strategies converging to the equilibrium. Though perfect Bayesian equilibrium would have been sufficient for some of the analysis, the main added benefit in this paper to using sequential equilibrium is that it ensures that the Veto player would update its beliefs reasonably from Group behavior even when the Challenger's strategy also resolves uncertainty about the state.[3]

2 Comments on model assumptions

The assumptions of the model are made to make the mechanisms supporting our results as transparent as possible. Several aspects of the model are worthy of additional comment. First, the Challenger has private information about the preferences of the group relative to the Veto player. This may have one of two main interpretations, both of which we consider reasonable in different

[2] This differs from the definition in Kreps and Wilson (1982) which considers only finite games and therefore requires a completely mixed strategy to assign positive probability to each action. However, this definition is used for isntance in Bajoori, Flesch and Vermeulen (2013).

[3] If we use only perfect Bayesian equilibrium, a problem arises in this game due to the Challenger and Group having the same private information. Namely, it would be unclear how to interpret deviations from an equilibrium in which both players are separating. Introducing the possiblity of trembles by both players resolves this problem.

applications. One interpretation is that the Challenger is close to a particular set of activists and therefore has better insights into what they will think about a given issue. This may be true, for example, of a labor-friendly candidate who has spent time discussing issues with union leaders and has relied on them for campaigning. Another intepretation is that ω is some underlying fact about the policy and that the Challenger is a specialist in this particular issue.

Second, the Veto player is somewhat dependent on campaign issues and electoral outcomes to learn about ω rather than learning about it directly. This may be controversial because polling data may be available or the Veto player could ask members of the group directly. However, this assumption is supported by our analysis since we will show that the electoral mechanism makes informational transmission possible when the Group and Challenger would both not have the appropriate incentives to reveal this information directly.

Third, we point out a few choices related to the credulity assumption. We assume the Group may sometimes be "credulous" meaning that they interpret campaign statements as literal promises about what will happen if the Challenger is elected. This assumption is made for fidelity with the motivating cases, where in our view relevant actors behaved as if all policy proposals were feasible. For instance, in the case of the Democratic primary mentioned in the introduction, candidates and advocates devoted significant time to working out finer details of competing Medicare for All plans. However, the credulity assumption is also more or less equivalent to a situation in which the Group may have expressive preferences, depending not on the actual final policy but on the policy expressed in the campaign. Relatedly, we assume that the probability of the Group being credulous, is common knowledge but that the Challenger and Veto player both do not learn whether the Group is or was credulous. Allowing players to be uncertain about the value of λ would not substantially change the analysis, but allowing either player to learn whether or not the Group was credulous could alter some conclusions from the model. That said, the assumption strikes us as reasonable since belief elicitation is difficult (Danz, Vesterlund and Wilson, 2022) and citizens' accounts of their own motives are notoriously unreliable (Murphy et al., 2020). Finally, our assumptions about credulity build in that it is a binary trait of the Group. That is, the Group is either entirely rational or entirely credulous. However, in settings where the Group aggregates preferences by some voting rule, λ could translate to uncertainty about the proportion of credulous voters in the Group and therefore about which type of Group member will be decisive in this decision.

Fourth, we offer the simplest version of post-election bargaining we can by allowing the Challenger to make a take-it-or-leave-it offer in an ultimatum bargaining fashion. A more complex bargaining structure with an open rule or allowing some back and forth may provide some other insights, but our goal is to represent in the simplest way possible that there are other political actors constraining what is feasible for the electoral candidates to do in office. Relatedly, we assume a particular spatial configuration of preferences, with the Veto player and Group each between the Incumbent (implicitly represented by the status quo policy q) and Challenger. In principle, we could easily analyze every spatial configuration of preferences and discuss overpromising in each setup. Though flipping left and right makes no difference for the equilibria, our choice of spatial configuration somewhat limits the scope of our analysis. We instead analyze this single case for several reasons. First, it corresponds to an empirically relevant instance in which overpromising is claimed to have happened: a relatively extreme left Challenger promises policies that some suspect exceed the feasible bargaining outcomes in the Senate, despite having a relatively extreme right incumbent in office. Second, there are several spatial configurations for which the strategic choices this paper attempts to speak to are irrelevant. For instance, when the Challenger does not have the opportunity to change policy at all (and therefore cannot say anything without overpromising) or when the Challenger can easily obtain its ideal point, the phenomenon we want to explain simply does not apply.

Fifth, for the sake of parsimony, we assume the Group's support is pivotal for the Challenger: the Challenger gains office with the support of the Group but not without it. The proofs of our results would not need to change significantly if the support of the Group simply increased the probability of winning the election, but this would add parameters to the model without adding very much insight. For instance, we could assume that the Challenger required support from the Group to gain office but that, given Group support, only won the election with some probability less than one. In most equilibria this would simply lower the Challenger's expected utility with no tangible effect on the Challenger's choice problem. The exception is the mixed strategy equilibrium discussed in Proposition 2, this would also quantitatively affect the probability of overpromising but the qualitative aspects of the equilibrium remain the same.

Sixth, we assume that the Veto player, like the Group, places some weight on the policy state. The Veto player's preferences can be interpreted in a couple of ways. One interpretation is that the Veto player cares directly about the preferences of the Group, for instance if the Group is also electorally important for the Veto player. An alternative interpretation is that the state captures substantive information about the effect of the policy about which the Veto player is directly concerned. Relatedly, even though the Challenger's utility function is independent of the state, knowledge of the state clearly affects the Challenger's behavior via electoral considerations.

3 Analysis

We will analyze the game starting with the bargaining stage and working backwards to the Challenger's platform announcement. The analysis reflects the idea that the Veto player's beliefs affect bargaining outcomes. As a result, the Challenger has an interest in affecting the Veto player's beliefs conditional on winning the election: the bargaining outcome is more favorable to the Challenger if the Veto player believes that the state is further to the left (i.e. that $\omega = \omega^L$ rather than that $\omega = \omega^R$). At the same time, a rational Group's strategy is affected by their anticipation of bargaining outcomes and therefore they consider how the Challenger's platform as well as their own support choice affects bargaining outcomes by changing the beliefs of the Veto player. The Veto player has two opportunities to learn about ω: the Challenger's platform may reveal private information about ω and the Group's support choice may also be informative.

3.1 Bargaining outcomes

We begin by characterizing the bargaining outcomes when the Challenger wins the election. Let μ denote the Veto player's beliefs at the bargaining stage, and let $\mathbb{E}_\mu[\omega]$ denote the expectation of ω with respect to those beliefs.

First, consider what happens when the Veto player's beliefs are degenerate at the bargaining stage, starting with the case where $\mu(\omega^R) = 1$. In this case, the bargaining stage boils down to a simple ultimatum bargaining game in which the Veto player's most preferred policy is $\alpha\omega^R$. The Veto player accepts any policy that she weakly prefers to the status quo, which are any policies in $[2\alpha\omega^R - q, q]$. Since $z_C < 2\alpha\omega^L - q < 2\alpha\omega^R - q$, the Challenger proposes $2\alpha\omega^R - q$ and this proposal is accepted. Likewise, if $\mu(\omega_L) = 1$, the bargaining outcome is $2\alpha\omega^L - q$.

Second, consider the case where the Veto player's beliefs μ are non-degenerate. We will argue that the natural equilibrium is one in which the Challenger always proposes $x = 2\mathbb{E}_\mu[\omega] - q$, which is the proposal that makese the Veto indifferent under the beliefs μ. To make this argument, however, we must account for the fact that proposals are potentially signals about ω. There is no separating equilibrium, since the Challenger would always make the leftmost acceptable proposal. However, there are a continuum of pooling equilibria in which the equilibrium proposal is $x^p \in [2\alpha\mathbb{E}_\mu[\omega] - q, 2\alpha\omega^R - q]$. To see why, suppose that the Veto player believes that $\omega = \omega^R$ when the proposal is $x < x^p$ and retains the beliefs μ when $x \geq x^p$. Then any proposal to the left of x^p is rejected and the Challenger's best response is to always propose x^p.

We have shown that the bargaining stage in which Challenger has beliefs μ is an equilibrium in which the bargaining outcome is $x = 2\mathbb{E}_\mu[\omega] - q$. Though there are other pooling equilibria detailed above, there are reasons to focus on this particular equilibrium. First, this equilibrium is optimal from the Challenger's perspective. Second, the off-path beliefs needed to support pooling equilibria in $(2\alpha\mathbb{E}_\mu[\omega] - q, 2\alpha\omega^R - q]$ require that the Veto player think that proposals further to the left signal states that are further to the right. For this reason, we assume that all players believe that only this pooling equilibrium will be played at the bargaining stage.

Assumption 1. In any bargaining stage in which Challenger initially holds beliefs μ, the Challenger does not pool on any $x^p \in (2\alpha\mathbb{E}_\mu[\omega] - q, 2\alpha\omega^R - q]$, so the bargaining outcome is always $x = 2\mathbb{E}_\mu[\omega] - q$.

Assumption 1 simplifies the remaining analysis to allow us to focus on the informativeness of campaign announcements and vote choices.

3.2 Benchmark: Rational Group

To provide a useful benchmark for the rest of the analysis, we start by analyzing the case in which $\lambda = 0$, which is to say the Group is always rational. Proposition 1 shows that the Challenger-preferred equilibria in this case are characterized by a simple cutoff condition: the Veto player learns the value of ω when $\alpha \geq \frac{\omega^R}{\omega^L}$ and learns nothing if $\alpha < \frac{\omega^R}{\omega^L}$. We can interpret $\frac{\omega^R}{\omega^L} \in (0,1)$ as a measure of closeness between the two states. This measure increases toward 1 as $\omega^R \to \omega^L$ and decreases toward 0 as either $\omega^R \to 0$ or as $|\omega^L|$ gets large. Recall that α is a measure of responsiveness of the veto player to beliefs about ω. Informative equilibria require that bargaining outcomes make it disadvantageous to the group to induce a belief in ω^L when the true state is ω^R. As a result, the Veto player learns about the state of the world when V's preferences are sufficiently responsive to beliefs and when ω^R and ω^L are not too close. Proposition 1 states the result and a full proof is in the Appendix.

Proposition 1 (Rational Group benchmark)**.** *Let $\lambda = 0$ and let Assumption 1 hold. The following hold in this benchmark game:*

- *If $\alpha < \frac{\omega^R}{\omega^L}$ then all equilibria are uninformative: the Challenger's platform does not depend on ω and the Group supports the Challenger regardless of the value of ω.*
- *If $\alpha \geq \frac{\omega^R}{\omega^L}$ there exists an informative equilibrium in which Challenger's platform is informative: for some $\{x^L, x^R\} \in X$ the Challenger chooses x^L when $\omega = \omega^L$ and x^R when $\omega = \omega^R$. In this equilibrium the Group supports the Challenger when $\omega = \omega^L$ following any message and supports the Challenger when $\omega = \omega^R$ only if $x = x^R$.*

- *Letting $\mathbb{E}[\omega]$ denote the prior expectation of ω, if $\alpha \in \left[\frac{\omega^R}{\omega^L}, \mathbb{E}[\omega]\right]$ then both the informative and uninformative equilibria described above exist. If $\alpha > \mathbb{E}[\omega]$ then the Veto player learns ω in all equilibria and in a Challenger-optimal equilibrium the Challenger's platform is informative.*

One way to interpret Proposition 1 is that, with no chance of credulous citizen groups, there is very little scope for the Challenger's platform to increase the level of information transmission in this setting. The condition $\alpha \geq \frac{\omega^R}{\omega^L}$ needed to support informative equilibria is really a condition to ensure that the Group's support strategy is informative. When this holds, the Group typically could transmit information to the Veto player with or without a Challenger platform that reveals the state. In that sense, the Challenger's platform does not add anything to the informational environment despite being independently informative. However, an alternative interpretation is possible in the region in which the informative and uninformative equilibria both exist. In that situation, a Challenger platform strategy that reveals the state could serve the role of selecting the informative equilibrium over the uninformative one.

3.3 Equilibria with credulity

We now turn to the broader model in which there is a positive probability that the Group behaves credulously. A credulous Group chooses whether or not to support the Challenger as if the announced policy platform will become the final policy in the event that the Challenger is elected. One immediate consequence of this is that some platform announcements elicit informative behavior from the credulous Group regardless of bargaining outcomes. Furthermore, this creates the possibility of credible information transmission from the Challenger where it was not possible before.

What platform announcements induce informative voting from a credulous Group? The set of policies preferred by the Group to the status quo are $[2\omega - q, q]$. Since any policy to the left of this interval will be unacceptable to the Group, any policy to the left of $2\omega^R - q$ but to the right of $2\omega^L - q$ induces informative strategies from the credulous Group. That is, for any Challenger policy platform in $[2\omega^L - q, 2\omega^R - q)$, a credulous Group will support the Challenger if $\omega = \omega^L$ but not if $\omega = \omega^R$.

One immediate consequence of the reasoning above is that there cannot be a fully uninformative equilibrium. Consider an assessment for which the Veto player never learns anything about the state. This must mean that the Challenger's platform is never in the interval $[2\omega^L - q, 2\omega^R - q)$, otherwise the strategies would be at least partially informative. However, any time $\omega = \omega^L$, the Challenger could deviate from this strategy to a point in that interval. Since the Challenger knows that $\omega = \omega^L$, this deviation does not risk the election. Furthermore, since the Veto player knows that there is *some* chance that the Group behaved credulously, seeing a Challenger gain office following this announcement must at least slightly increase the Veto player's belief in the likelihood that $\omega = \omega^L$. Thus, the Challenger wins some policy gain from this deviation without reducing its likelihood of gaining office, which makes this deviation profitable. This demonstrates why there are no uninformative equilibria.

The possibility of a credulous Group instead expands the possibilities for informative policy platforms from the Challenger. This is easiest to see in the case where all equilibria are uninformative in the benchmark with fully rational groups, but in which λ is sufficiently high. In this case, informative equilibria are sustained when the Challenger's announcements are in the informative credulous Group interval $[2\omega^L - q, 2\omega^R - q)$ when $\omega = \omega^L$ and to the right of that interval when $\omega = \omega^R$. Revealing that $\omega = \omega^L$ has an obvious policy benefit to the Challenger, so the constraint on this equilibrium is whether or not the Challenger is tempted to exaggerate and send the message associated with ω^L when the true state is ω^R. Group credulity serves as a limitation on the Challenger's temptation to exaggerate: if the likelihood that the Group is credulous is high enough, it is unattractive for the Challenger to try and exaggerate since the credulous Group will withdraw its support following this platform when in fact $\omega = \omega^R$. When λ is not high enough to deter this imitation, there is instead a mixed strategy equilibrium in which the Challenger sometimes exaggerates. The probability of exaggeration balances the policy benefits of exaggeration with the electoral costs. Proposition 2 states these results. The proof is provided in the Appendix and also lays out the precise beliefs and the value of the mixed strategies.

Proposition 2. *Let $\lambda > 0$ and let Assumption 1 hold. Then:*

- *There does not exist an uninformative equilibrium.*
- *If $\alpha \geq \frac{\omega^R}{\omega^L}$ there exists an informative equilibrium in which the Challenger announces $x^L \in [2\omega^L - q, 2\omega^R - q)$ when $\omega = \omega^L$ and $x^R \in [2\omega^R - q, q]$ when $\omega = \omega^R$.*
- *If $\alpha < \frac{\omega^R}{\omega^L}$ then:*
  (a) *If $\lambda \geq \frac{\alpha(\omega^L - \omega^R)}{\alpha\omega^L - q}$ then there is an informative equilibrium in which the Challenger announces $x^L \in [2\omega^L - q, 2\omega^R - q)$ when $\omega = \omega^L$ and $x^R \in [2\omega^R - q, q]$ when $\omega = \omega^R$, the rational Group always supports the Challenger, and the credulous Group supports the Challenger only when $\omega = \omega^L$ or when $\omega = \omega^R$ and the Challenger's platform is x^R.*
  (b) *If $\lambda < \frac{\alpha(\omega^L - \omega^R)}{\alpha\omega^L - q}$ then there exists a partially informative equilibrium in which the Challenger announces $x^L \in [2\omega^L - q, 2\omega^R - q)$ when $\omega = \omega^L$ and randomizes between x^L and $x^R \in [2\omega^R - q, q]$ when $\omega = \omega^R$, the rational Group always supports the Challenger, and the credulous Group supports the Challenger only when $\omega = \omega^L$ or when $\omega = \omega^R$ and the Challenger's platform is x^R.*

The equilibria described in both Proposition 1 and 2 are visualized in Figure 1, varying the credulity level (λ) and the responsiveness of the Veto player (α). The benchmark case of $\lambda = 0$ is shown along the horizontal axis, with a dark line representing uninformative equilibria. The partially informative equilibria exist for low enough values of α and λ, but in the rest of the space the equilibria are fully informative. The curved line separating the partially informative from the informative equilibria visualizes the restriction $\lambda \geq \frac{\alpha(\omega^L - \omega^R)}{\alpha\omega^L - q}$ for existence of informative equilibria when $\alpha < \frac{\omega^R}{\omega^L}$. One notable implication of these equilibria is that the Challenger may

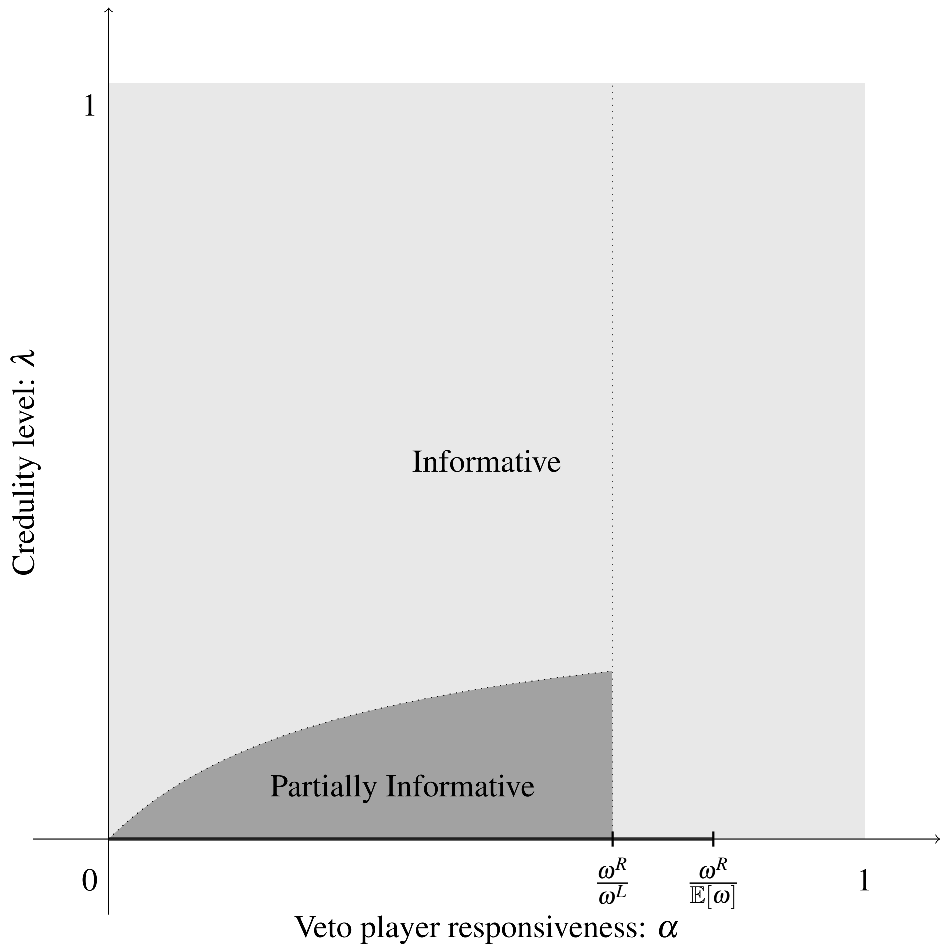

Figure 1: Regions associated with each type of equilibria, for hypothetical parameter values.
Note: The dark line represents the region in which an uninformative equilibrium exists when $\lambda = 0$, as detailed in Proposition 1.

sometimes lose the support of the Group by attempting to exaggerate, but this only happens in the partially informative equilibria and only happens when the Group behaved credulously.

One implication of Proposition 2 comes from comparing the results to what would happen if the Group were allowed to simply communicate about ω to the Veto player. If the Group were allowed to simply send cheap talk messages about ω, when could they credibly communicate this information to the Veto player? For this to occur, it must be the case that the Group prefers the bargaining outcome $2\alpha\omega^R - q$ to $2\alpha\omega^L - q$ when $\omega = \omega^R$ but *not* when $\omega = \omega^L$. Following Proposition 1, this is the case when $\alpha \geq \frac{\omega^R}{\omega^L}$, which is when the Group's support strategy is informative regardless of the Challenger's strategy. This is a useful observation for two reasons. First, it justifies our assumption that the Veto player does not learn about ω directly, since indeed the Group could not credibly reveal this information to the Group in the cases of most interest for our results. Second, it reinforces our interpretation of Proposition 2 as showing that the Challenger's strategy can only *add* information that would not be revealed otherwise when there is some credulity on the part of the Group.

3.4 Overpromising

We now return to one of the questions that motivated this paper: When do candidates overpromise, in the sense of making promises that are more extreme than any feasible bargaining outcome? To answer this question, recall that the bargaining outcome is $2\alpha\mathbb{E}_\mu[\omega]-q$ where $\mathbb{E}_\mu[\omega]$ denotes the expectation of ω with respect to the Veto player's beliefs. The left-most possible bargaining outcome is therefore $2\alpha\omega^L-q$ which occurs when the Veto player is fully convinced that $\omega=\omega^L$.

Having defined the left-most possible bargaining outcome, we then ask: when must equilibrium announcements include statements to the left of the left-most bargaining point? Our equilibrium in Proposition 2 requires an announcement in the interval $[2\omega^L-q, 2\omega^R-q)$ on the path of play. We want to learn about situations in which *all* equilibria must involve overpromising so we use the upper bound of that interval. Then the equilibrium must involve overpromising if

$$2\omega^R-q<2\alpha\omega^L-q.$$

This occurs when $\alpha<\frac{\omega^R}{\omega^L}$. Proposition 3 states the result. Proposition 3 is not proven separately in the appendix since the argument above is sufficient to demonstrate the truth of the result.

Proposition 3. *Let $\lambda>0$ and let Assumption 1 hold. When $\alpha<\frac{\omega^R}{\omega^L}$, all equilibria involve overpromising.*

Two implications of Proposition 3 merit discussion. First, the condition in the proposition makes clear predictions about when we might expect to see overpromising: this strategy is most likely to be observed when the Veto player is not too responsive to information about the state or when the possible states are not too different. Returning to the opening example, let us examine how these conditions weigh on to that case. Consider the claim of overpromising on healthcare policy by a socialist candidate for whom labor unions are a pivotal Group. The state may relate to the effects of a universal healthcare plan on labor union members: when $\omega = \omega^L$ they believe they will benefit from such a plan and when $\omega = \omega^R$ they have greater concerns about replacing their union won healthcare plans. The condition that the Veto player is not too responsive to the state can be interpreted as a scope condition that the pivotal player(s) in the Senate do not weigh labor interests too heavily in their decision-making. If they did, then there would not be much difference between the Veto player's preferences and the Group's preferences, so there would be very little scope for generating bargained outcomes that make the Group worse off. As a result, there would be little benefit to overpromising. The requirement that the possible states are not too different amounts to saying that the union members cannot have such an extreme preference over healthcare policy that they would vote informatively even for more moderate platforms. Both conditions taken together also suggest that overpromising as a strategy should break down when the consequences of policy bargaining are the most consequential to the Group.

A second implication of Proposition 3 comes from comparing the condition for overpromising to the equilibrium conditions in Proposition 1 and Proposition 2. The condition that $\alpha < \frac{\omega^R}{\omega^L}$ is exactly the same as the condition under which all equilibria are uninformative in the benchmark with fully rational groups, which in turn is the same as the condition under which equilibrium informativeness depends on the probability of credulity in general. Recall also that when $\alpha \geq \frac{\omega^R}{\omega^L}$ the Group can inform the Veto player of the state with or without informative Challenger platforms. In that sense, Proposition 3 suggests that any time the Challenger's behavior increases the total information transmitted to the Veto player, it must be through a strategy involving overpromising.

The benefits of credulity

We close by analyzing the *ex ante* expected utility of the Group across different parameters of the game. Our goal is to show that the Group may benefit from an increased probability of being the credulous type. Thus, we restrict our attention to the case of $\alpha < \frac{\omega^R}{\omega^L}$ and consider the effects of changing λ on the Group's *ex ante* expected utility.

The effect of increasing λ on the Group's *ex ante* expected utility is not immediately obvious because there are competing effects. First, increasing λ increases the informativeness of the Challenger's strategy, which tends to benefit the Group by bringing the final policy closer to its preferred policy. However, second, in the mixed strategy equilibrium, increasing λ increases the probability that the Group erroneously rejects the Challenger due to credulity when in reality electing the Challenger would have resulted in a more preferred policy.

As Proposition 4 shows the favorable effect of increasing λ dominates, so the group always weakly benefits from having a higher probability of credulity. The reason the more favorable effect dominates is that the risk of erroneously rejecting the Challenger only takes place when the Challenger attempts to exaggerate (i.e. promote the belief that $\omega = \omega^L$ when in reality $\omega = \omega^R$). Therefore, the risk associated with higher credulity is muted in equilibrium by the Challenger exaggerating less often.

Proposition 4. *Let $\alpha < \frac{\omega^R}{\omega^L}$. Then the Group's* ex ante *expected utility is increasing in λ.*

Proposition 4 suggests that, even in the absense of genuine credulity, a group may benefit if they can commit themselves to acting as if they are credulous. For instance, opinion leaders in a particular group may benefit from promoting a way of thinking about politics that does not account for constraints on individual policymakers. Doing so may surprisingly make it easier for the policymaker to sway veto players to choose policies more preferred by the Group.

One caveat for Proposition 4 is that the result depends more than the others on the behavioral interpretation of λ as credulity. Elsewhere, we suggested that the credulous type could be interpreted as merely having expressive rather than instrumental preferences, in which case the Group is acting rationally at all times. In our welfare analysis, however, we assume that the credulous group is making a mistake when they act differently from the rational group, so the credulity interpretation plays a clear role. Notice, however, that this is a conservative assumption from the perspective of proving Proposition 4: the Group is better off with a higher probability of credulity even though it can cause them to fail to maximize their expected utility.

Discussion and conclusions

We put forth a simple model of communication in electoral campaigns, in which a politician uses campaign statements to communicate to a Veto player about the popularity of that politician's preferred policies. The idea is that having an audience with whom the politician must gain favor in order to take office limits the ability of the politician to exaggerate when she may otherwise do so. This is especially true when some audience members may be credulous, meaning that they naively believe campaign promises, even those that cannot be achieved by bargaining. The existence of credulous voters not only increases the informativeness of campaign statements, but also plays a central role in explaining overpromising by politicians. Without credulous voters, the true state (the optimal policy for the Group) can be revealed only when the Veto player is sufficiently responsive to the Group in relation to the difference between two possible states. But the existence of credulous voters releases the above conditions and thus expands the set of informative equilibria since they would take the campaign statements seriously. Moreover, the existence of credulous voters incentivizes politicians to overpromise, since doing so increases the information about the state transmitted to the Veto player. On the contrary, overpromising would not benefit the politicians much when the Group is perfectly rational and the Veto player does not learn about the state from the announced platform and the election results.

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Proof of Proposition 1. For some belief $\Pr[\omega = \omega^L] = \hat{p}$ let $\mathbb{E}_{\hat{p}}[\omega] = \hat{p}\omega^L + (1-\hat{p})\omega^R$ denote the expected value of ω computed at that belief. From our prior analysis, the bargaining outcome induced when the Veto player believes that $\Pr[\omega = \omega^L] = \hat{p}$ is $2\alpha\mathbb{E}_{\hat{p}}[\omega] - q$. The Group is better off under the Challenger than under the incumbent given state ω' if

$$2\alpha\mathbb{E}_{\hat{p}}[\omega] - q \in [2\omega' - q, q]. \tag{3}$$

It is immediate that (3) always holds when $\omega' = \omega^L$. Furthermore, (3) holds when $\omega' = \omega^R$ if

$$\alpha < \frac{\omega^R}{\hat{p}\omega^L + (1-\hat{p})\omega^R}. \tag{4}$$

Furthermore, when $\alpha < \frac{\omega^R}{\omega^L}$ this holds for all beliefs including $\hat{p} = 1$.

This leads us to three cases which we analyze in turn.

- **Case 1:** $\alpha < \frac{\omega^R}{\omega^L}$. Here, the Group supports the Challenger regardless of its private information or the history of the game. Thus, any equilibrium is uninformative: Consider an assessment in which some platform x' induces a belief p' for the Veto player and another platform x'' induces a belief $p'' > p'$. Since the Challenger is always elected following either platform, the Challenger's utility from announcing x' is

  $$z_C - 2\alpha\mathbb{E}_{p'}[\omega] + q$$

  and the Challenger's utility from announcing x'' is

  $$z_C - 2\alpha\mathbb{E}_{p''}[\omega] + q.$$

  Since $\mathbb{E}_{p''}[\omega] < \mathbb{E}_{p'}[\omega]$ the Challenger has a higher payoff from announcing x'' regardless of the state, which shows that there does not exist an equilibrium that induces two distinct beliefs on the path of play. On the other hand, we can construct an uninformative equilibrium in which the Challenger completely randomizes over X independently of ω and the Veto player's beliefs are p following a platform in X.

- **Case 2:** $\alpha \in \left[\frac{\omega^R}{\omega^L}, \frac{\omega^R}{p\omega^L + (1-p)\omega^R}\right]$. The analysis above implies that there exists an uninformative equilibrium, since the Veto player's induced belief is p and therefore by (4) the Group supports the Challenger regardless of its private information.

  There is also an informative equilibrium in this case. Consider a profile in which two platforms x^L and x^R are chosen on the path of play, and:

- The Challenger chooses $x = x^L$ when $\omega = \omega^L$ and $x = x^R$ when $\omega = \omega^R$
- The Group supports the Challenger if $\omega = \omega^L$ following any platform and supports the Challenger if $\omega = \omega^R$ when the Challenger's platform is $x = x^R$ but not when $x = x^L$.
- The Veto player believes that

$$\Pr[\omega = \omega^L | x = x^L \text{ and Challenger wins}] = 1$$

  and

$$\Pr[\omega = \omega^L | x = x^R \text{ and Challenger wins}] = 0.$$

- For all off-path platforms $x' \in X \backslash \{x^L, x^R\}$, the Group does not support the Challenger when $x = x'$ and $\omega = \omega^R$, and the Veto player believes that

$$\Pr[\omega = \omega^L | x = x' \text{ and Challenger wins}] = 1.$$

  (This is just one specification of off-path actions and beliefs that support the informative equilibrium, though other choices also lead to the same conclusion.)

To see that this is an equilibrium, we first note that the Veto player's beliefs clearly follow from Bayes's rule on the path of play. For the off-path profiles, the beliefs support a bargaining outcome of $2\alpha\omega^L - q$ which is the same outcome as when $x = x^L$.

Since $\alpha \geq \frac{\omega^R}{\omega^L}$ the Group weakly prefers not to support the Challenger when $\omega = \omega^R$ and the Challenger's platform is $x = x^L$ since doing so induces the belief that $\omega = \omega^L$. This follows from the analysis above. The same analysis implies that the Group does not support the Challenger given the off-path platforms which induce the same bargaining outcome. Thus, the Group's best response is to support the Challenger when $\omega = \omega^L$ or when $\omega = \omega^R$ and the Challenger's platform is $x = x^R$, but to reject the Challenger when $\omega = \omega^R$ given any platform other than x^R.

Additionally, the Challenger has a best response to choose the platform x^L when $\omega = \omega^L$, since the Challenger wins the election and induces the (weakly) best bargaining outcome. The Challenger's best response when $\omega = \omega^R$ is to choose the platform x^R since all other outcomes result in losing the support of the Group and losing the election, leading to the Challenger's least-preferred outcome of q.

Finally, to ensure that the Veto player's off-path beliefs when $x_C \notin X \backslash \{x^L, x^R\}$ satisfy consistency, consider sequences $\varepsilon^n \to 0$ and $\nu^n \to 0$ and a sequence of strategy profiles in which the Challenger uses the prescribed strategy with probability $1-\varepsilon^n$ and randomizes uniformly over X with probability ε^n, and the Group uses the prescribed strategy with probability $1-\nu^n$ and randomizes uniformly over supporting or not supporting with probability ν^n. Then, for any $x' \in X \backslash \{x^L, x^R\}$, the Veto player's belief what $\omega = \omega^L$ given that the platform was x' and the Group supported the Challenger is:

$$\mu^n(\omega = \omega^L | x' \& \text{ G supports C}) = \frac{p\frac{\varepsilon^n}{\overline{x}-\underline{x}}\left(\frac{\nu^n}{2} - (1-\nu^n)\right)}{p\frac{\varepsilon^n}{\overline{x}-\underline{x}}\left(\frac{\nu^n}{2} - (1-\nu^n)\right) + (1-p)\frac{\varepsilon^n}{\overline{x}-\underline{x}}\left(\frac{\nu^n}{2}\right)}. \tag{5}$$

Furthermore, since $\varepsilon^n \to 0$ and $\nu^n \to 0$ we have:

$$\lim_{n\to\infty} \mu^n(\omega = \omega^L | x' \& \text{ G supports C}) = 1, \tag{6}$$

which shows that this assessment satisfies the consistency condition of Kreps and Wilson (1982).

- **Case 3:** $\alpha > \frac{\omega^R}{p\omega^L + (1-p)\omega^R}$. The analysis above shows that there is an informative equilibrium and there is not an equilibrium in which the Group's strategy is uninformative. To complete the proof we must also show that the Challenger-preferred equilibrium is the one in which the Challenger's platform strategy is also informative.

To set up this comparison, note that there are two types of equilibria in which the Group behaves informatively:

1. *Challenger is uninformative.* When the Challenger is uninformative, the Group is willing to support the Challenger when $\omega = \omega^L$ but not when $\omega = \omega^R$. As a result, the Veto player knows that $\omega = \omega^L$ when the Challenger takes office. There exist equilibria in which the Challenger's strategy is still uninformative. For instance, suppose the Challenger completely randomizes over platforms in X independently of ω. The message does not affect the Veto players' interim beliefs and the Group supports the Challenger if and only if $\omega = \omega^L$ regardless of the message. Therefore, the Challenger has no profitable deviation.

2. *Challenger is informative.* Consider a profile in which the Challenger is informative. That is, there are two platforms x^L and x^R used on the path of play and the Challenger chooses x^L when $\omega = \omega^L$ and x^R when $\omega = \omega^R$. Assume any platform off the path of play induces the belief that $\omega = \omega^R$.

   Following x^L, by the calculations above and the fact that this platform induces the Veto player to believe that $\omega = \omega^L$, the Group supports the Challenger when $\omega = \omega^L$ and not when $\omega = \omega^R$. Following x^R, which induces the Veto player to believe that $\omega = \omega^R$, the Group always supports the Challenger by (4).

   The Challenger has no profitable deviation from this profile. When $\omega = \omega^R$, the only meaningful deviation is to x^L which would cause the Challenger to lose the election and receive their worst possible payoff. When $\omega = \omega^L$, choosing x^L induces the bargaining outcome $2\alpha\omega^L - q$ and any other platform induces the bargaining outcome $2\alpha\omega^R - q$, which means that x^L is a best response.

Comparing these two cases, the equilibrium in which the Challenger is informative is optimal for the Challenger. When she is uninformative, she gets an expected payoff of $-p|z_C - 2\alpha\omega^L + q| - (1-p)|z_C - q|$ since she loses the election when $\omega = \omega^R$. When she is informative, she gets an expected payoff of $-p|z_C - 2\alpha\omega^L + q| - (1-p)|z_C - 2\alpha\omega^R + q|$ which is clearly better.

This completes the proof. $\square$

Proof of Proposition 2. The credulous Group supports the Challenger when $x_C \in [2\omega - q, q]$. This implies that the credulous Group votes informatively when $x_C \in [2\omega^L - q, 2\omega^R - q)$: for such a platform, the credulous Group supports the Challenger when $\omega = \omega^L$ but not when $\omega = \omega^R$.

We first show that there does not exist an uninformative equilibrium. An uninformative equilibrium cannot have any platforms in $[2\omega^L - q, 2\omega^R - q)$ on the path of play, so we consider the effects of deviating to some $x' \in [2\omega^L - q, 2\omega^R - q)$ when $\omega = \omega^L$ from an uninformative strategy profile. Since the credulous Group would not elect the Challenger when $\omega = \omega_R$ following x', the Veto player's belief is

$$\Pr[\omega = \omega^L] = \frac{p}{p + (1-p)(1-\lambda)} > p,$$

so this deviation is a strict improvement for the Challenger, which shows that there is no uninformative equilibrium.

The equilibrium when $\alpha \geq \frac{\omega^R}{\omega^L}$ follows from the proof of Proposition 1. The rational Group's best response when $\alpha < \frac{\omega^R}{\omega^L}$ is to always support the Challenger as shown in the proof of Proposition 1. Furthermore, the credulous Group supports the Challenger following x^R for either state and supports the challenger following x^L only when $\omega = \omega^L$. The informative strategy is therefore a best response for the Challenger provided that the Challenger would not deviate to announcing x^L when $\omega = \omega^R$. This holds if

$$-(1-\lambda)|z_C - 2\alpha\omega^L + q| - \lambda|z_C - q| \leq -|z_C - 2\alpha\omega^R + q|. \tag{7}$$

Since $z_C < 2\alpha\omega^L - q < 2\alpha\omega^R - q$ this simplifies to

$$(1-\lambda)(z_C - 2\alpha\omega^L + q) + \lambda(z_C - q) \leq z_C - 2\alpha\omega^R + q \tag{8}$$

which reduces to $\lambda \geq \frac{\alpha(\omega^L - \omega^R)}{\alpha\omega^L - q}$, as claimed.

Finally we move to the mixed strategy equilibrium. Let $\zeta := \Pr[x_C = x^L | \omega = \omega^R]$. Then the Veto player's beliefs when the Challenger announces x^L and gains the support of the Group are:

$$\mu(\omega = \omega^L | x_C = x^L \text{ \& G supports C}) = \frac{p}{p + (1-p)\zeta(1-\lambda)}. \tag{9}$$

Therefore we have

$$\begin{aligned} \mathbb{E}[\omega | x_C = x^L \text{ \& G supports C}] =& \frac{p}{p+(1-p)\zeta(1-\lambda)}\omega^L + \left(1 - \frac{p}{p+(1-p)\zeta(1-\lambda)}\right)\omega^R & (10) \\ =& \frac{p(\omega^L - \omega^R)}{p(1-\zeta(1-\lambda)) + \zeta(1-\lambda)} + \omega^R & (11) \end{aligned}$$

Then the Challenger's mixed strategy is ζ such that

$$(1-\lambda)(z_C - 2\alpha\left(\frac{p(\omega^L - \omega^R)}{p(1-\zeta(1-\lambda)) + \zeta(1-\lambda)} + \omega^R\right) + q) + \lambda(z_C - q) = z_C - 2\alpha\omega^R + q. \tag{12}$$

Solving for ζ, we get

$$\zeta^* = \frac{p(\alpha\omega^R - (1-\lambda)\alpha\omega^L - \lambda q)}{(1-p)(1-\lambda)\lambda(q - \alpha\omega^R)}. \tag{13}$$

This expression is bounded above by one and is positive exactly when $\lambda < \frac{\alpha(\omega^L - \omega^R)}{\alpha\omega^L - q}$. □

Proof of Proposition 4. It is sufficient to analyze welfare in the mixed strategy equilibrium since the pure strategy equilibria can be obtained as limiting cases when $\lambda \to 0$ or when $\lambda \to \frac{\alpha(\omega^L - \omega^R)}{\alpha\omega^L - q}$. In a mixed strategy equilibrium, let

$$\zeta(\lambda) := \frac{p(\alpha\omega^R - (1-\lambda)\alpha\omega^L - \lambda q)}{(1-p)(1-\lambda)\lambda(q - \alpha\omega^R)} \tag{14}$$

and let

$$\hat{\omega}(\lambda) := \frac{p(\omega^L - \omega^R)}{p(1-\zeta(\lambda)(1-\lambda)) + \zeta(\lambda)(1-\lambda)} + \omega^R. \tag{15}$$

In these expressions, $\zeta(\lambda)$ is the probability that C announces x^L when $\omega = \omega^R$ (i.e. the probability of exaggerating) and $\hat{\omega}(\lambda)$ is the Veto players' expectation of ω after observing x^L and bargaining with the Challenger. Both of these are derived in Proposition 2 and simply expressed as a function of λ for our purposes.

The Group's *ex ante* expected utility is

$$U(\lambda) = -p(2\alpha\hat{\omega}(\lambda) - q - \omega^L) \tag{16}$$

$$- (1-p)\left[\zeta(\lambda)(1-\lambda)(2\alpha\hat{\omega}(\lambda) - q - \omega^R) + \zeta(\lambda)\lambda(q - \omega^R) + (1-\zeta(\lambda))(2\alpha\hat{\omega}(\lambda) - q - \omega^R)\right] \tag{17}$$

$$= \frac{1}{1-\lambda}\left[\omega^L p(1-\lambda) + q(1-\lambda+2p\lambda) + \omega^R(1-p-2\alpha(1-\lambda) - \lambda + p(1-2\alpha)\lambda\right] \tag{18}$$

where the last line comes from substituting the definitions of $\zeta(\lambda)$ and $\hat{\omega}(\lambda)$ and then simplifying. Differentiating (18) gives

$$\frac{dU}{d\lambda} = \frac{2p(q - \alpha\omega^R)}{(1-\lambda)^2} \tag{19}$$

which is positive since $\omega^R < 0$. $\square$