At the Helm, Kirk or Spock? Why Even Wholly Rational Actors May Favor and Respond to Charismatic Leaders*

Benjamin E. Hermalin†

Abstract

When a leader makes a purely emotional appeal, rational followers realize she is hiding bad news. Despite such pessimism and even though not directly influenced by emotional appeals, rational followers' efforts are nonetheless greater when an emotional appeal is made by a more rather than less charismatic leader. Further, they tend to prefer more charismatic leaders. Although organizations can do better with more charismatic leaders, charisma is a two-edged sword: more charismatic leaders will tend to substitute charm for real action, to the organization's detriment. This helps explain the literature's "mixed report card" on charisma.

Keywords: leadership, charisma

*The paper has benefited from the comments and suggestions of Prithwiraj Choudhury, Armin Falk, Marina Halac, Ola Kvaløy, Meg Meyer, Jean Tirole, Junjie Zhou, and participants at the Hitotsubashi University Conference on Leadership (where it was presented under a slightly different title) and at a seminar at the Toulouse School of Economics. The financial support of the Thomas and Alison Schneider Distinguished Professorship in Finance and the hospitality of Nuffield College, University of Oxford, are gratefully acknowledged.

†University of California • Department of Economics • 530 Evans Hall #3880 • Berkeley, CA 94720–3880 • email: hermalin@berkeley.edu.

Date: July 27, 2014 (version 19)

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1 INTRODUCTION

In the classic TV show *Star Trek*, command of the Starship Enterprise was given not to the smartest and most knowledgeable character, Spock, but to a more emotionally aware and charismatic character, Kirk. In real life, as in fiction, charisma is rewarded; in particular, successful leaders possess an ability to connect and inspire their followers at an emotional level.[1]

Although prevalent and apparently effective, appealing to emotions is something of a puzzle. To reference another classic TV series, shouldn't followers want "just the facts"? Indeed, a rational follower should be suspicious of an emotional appeal: if the leader's case is truly strong, why doesn't she simply present the facts? Yet, as I show, even wholly rational actors will respond positively to charismatic leaders and their emotional appeals.[2] In particular, they will work harder in response to an emotional appeal from a more charismatic leader than in response to such an appeal from a less charismatic leader.

At the same time, if all followers were wholly rational, then charisma would be irrelevant (see Proposition 6). For charisma to be relevant it must resonate in some intrinsic way with at least a small fraction of followers—referred to here as "emotional responders." As detailed below, a leader's charisma effectively inspires emotional responders to work harder in the public (organization's) interest.[3] But how does this explain *rational* followers' positive reaction to charisma? Moreover, also detailed below, there are a number of other issues and effects—positive and negative—associated with charisma.

Reference has already been made to one such issue: emotional appeals conceal information. As Hermalin (1998) notes, a team can do better in expectation when its members know the marginal return to their efforts (the productivity state) when deciding how much effort to supply than if ignorant. Hence, if a leader makes an emotional appeal at the expense of revealing the productive state, this imposes a cost on the organization. So if the organization consists mostly of rational actors—those not directly susceptible to emotional appeals—or the emotional responders are only slightly susceptible or both, then an ob-

[1] For instance, being the "great communicator" is seen as a key to President Reagan's success (see, *e.g.,* "Why Reagan was the 'great communicator'," Lou Cannon, *USA Today*, June 6, 2004). Indeed, the ability to connect at an emotional level is generally seen as crucial to presidential success: as the political scientist Thomas Cronin put it, "A president or would-be president must be ... warm and accessible but not too folksy, down to earth" (quoted in Rockman, 1984, p. 175). Also see Greenstein (2004), which *inter alia*, considers the role of communication skills to the success (or not) of modern US presidents.

[2] The leadership literature offers many, largely complementary, definitions of "charismatic leader" (see, *e.g.,* discussions in House et al., 1991, p. 366, or Awamleh and Gardner, 1999, p. 347). For purposes here, a good definition is charismatic leaders are those who "by the force of their personal abilities are capable of having profound and extraordinary effects on followers" (House and Baetz, 1979, p. 339).

[3] Shamir et al. (1993), Chatman and Kennedy (2010), Wang et al. (2011), and van Vugt and Ronay (forthcoming) survey the social-psychological evidence for this phenomenon. In economics, Dal Bó and Dal Bó (2013) and Kvaløy et al. (2013) find evidence that emotional appeals (albeit not made by a leader in their experiments) act as incentives.

vious prediction would seem to be that the organization does better without a charismatic leader (to have, *e.g.,* Spock at the helm rather than Kirk).

That prediction is, however, naïve: it overlooks that the leader could be "savvy"; that is, able to tailor her appeal to the circumstances. As shown below, a savvy leader makes an emotional appeal when "just the facts" provide followers too little incentive and, conversely, makes a rational appeal when the facts "speak for themselves." Followers (at least rational ones) will, of course, understand this is how she behaves. In particular, the rational ones—called "sober responders"—will form pessimistic beliefs about the productivity state upon hearing an emotional appeal. But how pessimistic depends on how charismatic the leader is. Because a more charismatic leader is more inclined to make an emotional appeal *ceteris paribus*, sober responders are less pessimistic about the state when a more charismatic leader makes an emotional appeal than when a less charismatic leader does. So, even though not directly influenced by emotional appeals, sober (rational) responders work harder in equilibrium in response to an emotional appeal from a more charismatic leader than in response to such an appeal from a less charismatic leader.

If leaders are savvy, then, as just suggested, the informational cost of an emotional appeal is lower when it comes from a more rather than less charismatic leader. Further, more charismatic leaders' emotional appeals induce greater effort from emotional responders than do their less charismatic counterparts'. Sober responders—those *not* intrinsically susceptible to charisma—will, correspondingly, prefer more charismatic leaders to less charismatic leaders.

What about emotional responders? An emotional appeal leads them, in essence, not to act in their own self interest; hence, a key issue is whether they are aware they are vulnerable to charisma. If unaware—they believe themselves to be sober responders—then they will either be indifferent to a leader's charisma (if they erroneously believe all followers are sober) or they will prefer greater charisma (if they erroneously believe that they are immune to charisma, but others are not). But if aware, then they can prefer a less charismatic leader to a more charismatic leader. An irony, therefore, is that the followers not directly responsive to charisma want a more charismatic leader, while those who are responsive can want a less charismatic leader.[4] See Section 5 for details.

In the basic model, an organization's expected production is greater with a more charismatic leader than a less charismatic one (Proposition 4). This could explain, in part, why organizations seek charismatic leaders.

At the same time, some scholars argue too much emphasis is given to charisma when selecting leaders (see, in particular, Meindl, 1990 & 1995, and Khurana, 2002a,b) or too much attributed to leadership skills (*e.g.,* Weber et al., 2001, and Wasserman et al., 2010). This paper helps reconcile those views with more positive views of charisma: when the productivity state is high, charisma is irrelevant; it matters only in low-productivity states. Hence, someone looking

[4]Or, in *Star Trek* terms, on a mixed ship of humans (emotional responders) and Vulcans (sober responders), the Vulcans could prefer a human captain (*e.g.,* Kirk, a charismatic leader) and the humans a Vulcan captain (*e.g.,* Spock, an uncharismatic leader).

at the data might see that when organizations do well, there is little evidence that the leader's charisma mattered.

The paper offers additional explanations for the mixed views of charisma's value. For instance, rather than being savvy, it could be that leaders are either knowledgeable, but lacking in charisma (a type called "professors" below) or ignorant, but charismatic ("demagogues"). Now there is a tradeoff between the incentive benefits of charisma and the loss due to followers' ignorance of the productivity state. As discussed in Section 4, it is ambiguous whether the organization does better with a professor or a demagogue at the helm; a finding that could help explain the ambiguity in the empirical results.

Another explanation for the ambiguous empirical results arises if the leader, rather than being endowed with knowledge of the productivity state (as in the basic model), must incur a cost to learn it. Because a more charismatic leader is more likely to make an emotional appeal (*i.e.,* not reveal the state) than a less charismatic one, she values knowing the state less than a less charismatic one. Highly charismatic leaders, therefore, choose *not* to learn the state; that is, they endogenously choose to be demagogues. Consequently, in contrast to Proposition 4, the organization can actually do better with a less charismatic leader than a more charismatic leader. See Section 6 for details.

Yet another alternative is the productivity state is something of the leader's choosing. Specifically, in Section 7, the leader enhances productivity through her efforts. An emotional appeal reduces her incentives to work hard because her followers won't see what she's done and, thus, can't respond to it. Yet, the more charismatic she is, the more emotional responders work in response to an emotional appeal, which boosts her work incentives. Combined, the two effects make the organization's payoff non-monotonic in charisma: for "middle levels" of charisma, the organization is worse off than it would be if it had either a far less charismatic leader or a far more charismatic one.

Sections 6 and 7, as well as some results in Section 8, demonstrate that a potential downside to charisma is it tempts a leader to "rely on her charms"; that is, substitute charisma for real action (learning information, enhancing productivity, or working hard herself). These sections, thus, offer further explanations for the empirical and management literatures' mixed assessment of charisma's value.

There is an immense social-science literature on leadership (an excellent entree is Nohria and Khurana, 2010). Within economics, the amount of scholarship is more modest (for surveys, see Bolton et al., 2010; Zupan, 2010; or Hermalin, 2013). Economic modeling of leadership typically follows one of two approaches: in the first, the leader is better informed about a payoff-relevant state than her followers and the issue is how she credibly conveys this information to her followers;[5] in the second, the leader possesses some bias (vision, strong beliefs, or leadership style) that effectively commits her *ex ante* to courses of desirable

[5] A partial list of papers pursuing this approach includes Hermalin (1998, 2007), Kobayashi and Suehiro (2005), Andreoni (2006), Komai et al. (2007), Komai and Stegeman (2010), and Zhou (2011).

actions that would be *ex post* incredible were she lacking that bias.[6,7]

This paper has ties to both those strains of the literature. In common with the first is the question of how the leader informs her followers. At the same time, this paper departs from that literature in two ways. In the existing literature, while the leader would like to conceal bad news, to do so would generate such pessimistic beliefs in her followers that she is compelled to reveal her information; indeed, a central finding of that literature is that she would, if possible, wish to establish a reputation for honestly reporting her information always (see, in particular, Hermalin, 2007). In contrast, here, a sufficiently charismatic leader can conceal bad news without triggering such pessimistic beliefs; indeed, the more charismatic she is, the less pessimism there is in response to her concealing information. A second departure point is that, for most of this paper, the leader's information is *hard*—she can conceal it, but, if she chooses to reveal it, she must do so truthfully. In contrast, the earlier literature focused on soft information—not only could she conceal what she knew, but she could also misrepresent it. In Section 8, I extend the analysis to soft information, to allow for leading by example.

Like the second strain, this paper is premised on the leader's possessing a personality characteristic, in this case charisma. Also similar is that (some) followers respond rationally to that characteristic (*i.e.,* sober responders understand how charisma affects the leader's play and they set their strategy accordingly). A key difference, however, is that, in the earlier literature, it is the leader who is irrational—her biases mean she behaves differently than would a wholly rational actor—while the followers are rational. Here, instead, the leader is wholly rational (savvy) and it is some fraction of her followers who are, at least in part, irrational. Focusing on rational leaders is important insofar as there are reasons to believe the most successful leaders are in control of their emotions.[8]

Two papers outside this two-strain taxonomy warrant comment. One is Kvaløy and Schöttner (2014), which considers a leader's efforts to motivate her single follower. There are, though, critical differences: in Kvaløy and Schöttner, the leader can vary the impact of her motivational efforts continuously, but there is no scope for charisma, whereas here the impact of her motivational "effort"—an emotional appeal—depends on her endowment of charisma; in Kvaløy and Schöttner, the leader has no private information, whereas here asymmetric in-

[6] A partial list of papers pursuing this approach includes Rotemberg and Saloner (1993, 1994, 2000), Van den Steen (2005), and Blanes i Vidal and Möller (2007).

[7] A small empirical literature in economics also exists; see Choudhury and Khanna (2013) as an example and for a partial survey of the literature. Hermalin (2013, §2.3.2.3) reviews some of the experimental work testing models of leadership.

[8] Max Weber referred to this as "the firm taming of the soul" (quoted in Greenstein, 2004, p. 6). Greenstein cites Weber in making the argument that a successful president has the "the ability to manage his emotions and turn them to constructive purposes, rather than being dominated by them" (p. 6). Also see House et al. (1991) on this point. Bruttel and Fischbacher (2013) provide experimental evidence suggesting that leaders have better internal loci of control than non-leaders.

formation is central; and, in Kvaløy and Schöttner, the follower is, effectively, an emotional responder, whereas here a key issue is how a charismatic leader (indirectly) influences wholly rational followers.

The other paper outside the taxonomy is Huck and Rey-Biel (2006). Their single follower is biased toward making his effort conform to the leader's example. This is similar to identity, one explanation offered below for why emotional responders are receptive to emotional appeals. On the other hand, with the exception of Section 8, this paper has no leading by example, thus no scope for conformity. In Section 8, however, I assume a leader faces a choice between making an emotional appeal and signaling her information via action (*i.e.,* it addresses the question of when do actions speak louder than words and *vice versa*). But an alternative view is that a leader's charisma "enhances" the message contained in her leading by example. I briefly explore that alternative in Section 8.1, which melds Huck and Rey-Biel, which has no asymmetric information, with Hermalin (1998), which does, but which assumes no conformity/identity biases.

With the exception of lemmas, proofs are in the text (some, though, precede the statement of the result in question); the proofs of lemmas are in Appendix A.

2 Basic Model

2.1 Assumptions

An organization has a leader and two kinds of followers: emotional responders (subscript E) and sober—alternatively, sophisticated or skeptical—responders (subscript S). There are n_E emotional responders and n_S sober responders. Let $N = n_E + n_S$.

A follower, m, supplies effort, $e_m \in \mathbb{R}_+$. The followers' efforts determine the value, V, of a non-rivalrous public good:[9]

$$V = \theta \sum_{m=1}^{N} e_m \,. \tag{1}$$

The parameter $\theta \in [\underline{\theta}, \overline{\theta}] \subset \mathbb{R}_+$ is the productivity state. Although one can readily imagine alternatives to (1), it has a number of advantages in terms of modeling; in particular, followers' efforts are neither strategic substitutes nor complements, so the results below are not driven by those factors.[10] This

[9] Alternatively, their efforts could yield some divisible output. Given suitable assumptions about the disutility-of-effort function, the optimal division is equal division (see, *e.g.,* Hermalin, 1998, for details). It is readily seen that the analysis that follows would, then, continue to apply.

[10] Complementary efforts might boost the benefit of having a charismatic leader: as will be seen, a charismatic leader directly generates more effort from emotional responders, which would, were efforts complementary, indirectly lead to more effort from sober responders. At the same time, however, emotional appeals directly depress the effort of sober responders, which would reduce emotional responders' incentives. This *lessens* the benefit of charisma. While allowing for such effects could be interesting, doing so is tremendously costly in terms of tractability and analytic clarity. This, in part, is why I follow the rest of the leadership-in-teams literature by assuming efforts are neither substitutes nor complements.

permits a focus on the role of information.

The timing of the game is that nature draws θ according to some distribution function, which has a positive derivative (density) everywhere. That function is common knowledge. The leader then learns θ; this is her private information. Next, she decides whether to make a rational or emotional appeal. A rational appeal means revealing θ truthfully (*i.e.,* θ is *hard* information—the leader can conceal it, but not falsify it). An emotional appeal is one in which she suppresses information about θ and simply exhorts her followers to work hard. Sober responders, at least, can distinguish rational from emotional appeals. If they hear the latter, they make inferences about θ. As discussed below, emotional responders may also do that, in part. Given either their knowledge of θ or the inferences they have made, followers then choose their efforts to maximize their objective functions.

At this juncture, assume that the leader's objective is to maximize V.

A follower's objective depends on whether he is an emotional or sober responder; and then only if the leader makes an emotional appeal. Given a *rational* appeal, the utility of follower m is

$$V - c(e_m)\,, \tag{2}$$

where $c : \mathbb{R}_+ \to \mathbb{R}_+$ is a disutility-of-effort function common to all followers. Critically, (2) remains a *sober* responder's utility function if the leader makes an emotional appeal.

To ensure followers have unique best responses and to avoid corner solutions, assume the disutility-of-effort function is thrice continuously differentiable; $c(0) = c'(0) = 0$; and marginal disutility, $c'(\cdot)$, is strictly increasing and unbounded.

The results that follow depend only on emotional responders working harder in response to an emotional appeal from a more charismatic leader than in response to one from a less charismatic leader. While such a "black-box" specification would work, I have chosen, for two reasons, to derive that effect from more primitive assumptions. The first reason is to show that emotional responders need not be wholly irrational; indeed, they could be nearly rational (the parameter μ, shortly to be introduced, could be close to zero). The second is to be able to suggest some channels through which charisma operates.

Assume, in response to an emotional appeal, an emotional responder maximizes

$$\big(\mu\chi + (1-\mu)\widehat{\theta}\big)e_m - c(e_m) + U(\mathbf{e}_{-m}, \chi, \widehat{\theta}\,)\,, \tag{3}$$

where $\chi \in \mathbb{R}_+$ is the leader's charisma, $\mu \in (0, 1]$ is how emotionally "μanipulable" such responders are, $\widehat{\theta}$ is what a wholly rational actor would infer θ was upon hearing an emotional appeal, and U is an additional component of utility *not* dependent on the responder's own action. For much of what follows, U is irrelevant. Observe a sober responder is equivalent to an emotional responder for whom $\mu = 0$ and $U = \widehat{\theta}\sum_{j\neq m} e_j$. A subtle issue is whether (3) *is* an emotional responder's utility or he just behaves as if it is. I deal with that issue later, when I consider followers' leadership preferences.

Expression (3) is consistent with two broad views of charisma and behavior:

1. Emotional responders are subject to some naïveté: they underweight the fact that an emotional appeal lacks content; that is, they get caught up in the leader's charm, rhetoric, or ability to tell a persuasive story. As Awamleh and Gardner (1999) and Greenstein (2004), among others, note, one definition of charisma is the ability to be persuasive. As a possible formalization of this idea, one could interpret χ as

$$\chi = (\overline{\theta} - \theta_B)p + \theta_B \,, \tag{4}$$

where p is the leader's persuasiveness and θ_B is some baseline belief that emotional responders have about the state (perhaps the unconditional expectation $\mathbb{E}\theta$; or $\underline{\theta}$ if they are pessimistic or suspicious). In other words, the charisma measure, χ, correlates with the leader's ability to persuade naïve followers that the productive state lies above their baseline belief.[11]

2. An emotional appeal changes emotional responders' preferences: for instance, making them want to please the leader, to gain or maintain her approval.[12] The degree to which this happens—the value they place on pleasing the leader or winning her approval—is captured by χ. Alternatively, an emotional appeal causes them to identify with the leader and her wishes.[13] An identity interpretation of (3), following ideas in Akerlof and Kranton (2000), would replace (3) with

$$(1-\mu)\widehat{\theta}e_m - \mu\chi(e^{**} - e_m) - c(e_m) + U(\mathbf{e}_{-m}, \chi, \widehat{\theta}\,) \,, \tag{3$'$}$$

where, now, μ is the weight the follower places on the identity component of utility (so $1-\mu$ is the weight on the "selfish" component), e^{**} is some idealized level of effort, and χ is how strongly the follower is induced to

[11] Building on a comment of Prithwiraj Choudhury's concerning an earlier draft, rather than formalize persuasion via (4), one could replace (3) with

$$\big(\chi\overline{\theta} + (1-\chi)\widehat{\theta}\big)e - c(e) + U(\mathbf{e}_{-m}, \chi, \widehat{\theta}\,) \,;$$

that is, interpret χ as the leader's ability to persuade emotional responders the state is excellent and to underweight their own rational inference of it based on her having made an emotional appeal. It can readily be seen that this alternative also leads to emotional responders supplying more effort, in equilibrium, in response to an emotional appeal from a more charismatic leader than in response to one from a less charismatic leader. As already noted, this is all that is needed for the principal results of the paper to hold. For the sake of brevity, I do not address this alternative further.

[12] Many personality cults in dictatorships portray the dictator as a father figure, perhaps to tap into people's desire for parental approval. See, *e.g.,* Wedeen (1998) on such a portrayal of the late Syrian dictator Hafez al-Assad; or Armstrong (2005) concerning the late North Korean dictator Kim Il Sung.

[13] "Charismatic leadership works in part by influencing followers to identify with a collective enterprise and internalize group aspirations" (van Vugt and Ronay, forthcoming, summarizing a number of studies in social psychology). Also see Shamir et al. (1993) for evidence.

identify with the interests of the leader or society.[14] Formulation (3′) generates identical behavior to (3).

Assume the leader's charisma, χ, is common knowledge. It could be so because of an earlier, unmodeled, stage in which followers get to know the leader. The assumption appears empirically justified: for instance, consensus is quickly reached on how charismatic politicians are (Reagan, *e.g.,* was universally seen as the "great communicator").[15]

As was implicit in the presentation above, I assume that the leader can make an emotional appeal or a rational one, but not both. This can be justified as reflecting "bandwidth" limitations (*e.g.,* followers have a limited attention span or the leader has limited time to make her case). Alternatively, trying to make both appeals simultaneously muddies the waters, diminishing the effectiveness of each. I note this either-or assumption need not be critical: Appendix B considers two extensions in which the leader is able to send whatever weighted average of an emotional and rational appeal she wishes; the results, however, prove to be identical to those presented in the text.

As was also implicit, I assume that the leader must make an appeal; she cannot be silent. Given that the leader incurs no cost to make an appeal and her information is hard, this assumption can be justified via a standard unraveling argument (*e.g.,* as in Grossman, 1981); that is, no appeal is seen by the followers as an admission that the state is $\underline{\theta}$, the minimal state. Hence, the leader finds no appeal dominated, at least weakly, by some sort of an appeal and, thus, there is no loss in assuming she must make an appeal.

2.2 Preliminary Analysis

For an arbitrary constant $\zeta > 0$, the properties of $c(\cdot)$ imply the program $\max_e \zeta e - c(e)$ has a unique interior solution, call it $e^*(\zeta)$; and that $e^*(\cdot)$ is strictly increasing. Moreover, by the implicit function theorem, $e^*(\cdot)$ is differentiable on $(0, \infty)$.

Because the efforts of other followers do not affect a given follower's utility-maximization program, each follower responds to a rational appeal by supplying effort $e^*(\theta)$. If they receive an emotional appeal, the followers will form some expectation, $\widehat{\theta}$, about θ. A sober responder will, then, maximize $\widehat{\theta}e - c(e)$; and an emotional responder

$$\big(\mu\chi + (1-\mu)\widehat{\theta}\,\big)e - c(e)\,.$$

The respective efforts of rational and emotional responders in response to an emotional appeal will, thus, be $e^*(\widehat{\theta})$ and $e^*\big(\mu\chi + (1-\mu)\widehat{\theta}\,\big)$. For future convenience, define $\Omega(\chi, \theta) = \mu\chi + (1-\mu)\theta$. Note Ω increases in each of its arguments.

[14] Section 8.1 explores a related specification in which e^{**} is the leader's effort.

[15] That various measures of charisma have been validated in the social-psychology literature (see, *e.g.,* Conger and Kanungo, 1994, and Awamleh and Gardner, 1999) provides further evidence that people's assessment of charisma are strongly correlated.

Denote the expectation of θ conditional on it not exceeding ζ by $\Theta^{\mathbb{E}}(\zeta)$; that is, $\Theta^{\mathbb{E}}(\zeta) = \mathbb{E}\{\theta | \theta \leq \zeta\}$. Necessarily, $\Theta^{\mathbb{E}}(\cdot)$ is increasing, $\Theta^{\mathbb{E}}(\underline{\theta}) = \underline{\theta}$, and $\Theta^{\mathbb{E}}(\overline{\theta})$ is the unconditional mean, $\mathbb{E}\theta$.

3 Equilibrium of the Basic Model

The leader wishes to make an emotional appeal when the state is θ if and only if that will yield a larger V than a rational appeal; that is, if and only if

$$\Big(n_S e^*(\widehat{\theta}) + n_E e^*\big(\Omega(\chi, \widehat{\theta})\big)\Big)\theta \geq N e^*(\theta)\theta\,, \tag{5}$$

where $\widehat{\theta}$ is the followers' expectation of the state given an emotional appeal. Because $e^*(\cdot)$ is strictly increasing, it is invertible; hence condition (5) can be restated as the leader will prefer an emotional appeal if and only if

$$e^{*-1}\left(\frac{n_S}{N} e^*(\widehat{\theta}) + \frac{n_E}{N} e^*\big(\Omega(\chi, \widehat{\theta})\big)\right) \geq \theta\,. \tag{6}$$

It follows that the leader's best response to the followers' beliefs is a cutoff strategy: an emotional appeal if $\theta \leq \theta_C$ and a rational appeal if $\theta > \theta_C$, where the cutoff, θ_C, equals the lefthand side of (6). If the lefthand side of (6) exceeds the maximum possible state, $\overline{\theta}$, the "cutoff" is $\overline{\theta}$. In equilibrium, followers' beliefs must be consistent with the cutoff strategy; that is, $\widehat{\theta} = \Theta^{\mathbb{E}}(\theta_C)$.

Proposition 1. *If the leader is sufficiently uncharismatic—specifically, if $\chi \leq \underline{\theta}$—then the only perfect Bayesian equilibrium is one in which she makes a rational appeal only. Otherwise, the only perfect Bayesian equilibria are those in which the leader makes an emotional appeal given states below a cutoff level and at least one such equilibrium exists.*[16]

Proof: Suppose $\chi \leq \underline{\theta}$ and there were an equilibrium in which the leader made an emotional appeal in at least some states (*i.e.,* $\theta_C > \underline{\theta}$). Rationality of beliefs

[16] Observe no claim is made about uniqueness. There is an equilibrium with cutoff $\theta < \overline{\theta}$ if

$$\Lambda(\theta) \equiv n_S e^*\big(\Theta^{\mathbb{E}}(\theta)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta)\big)\Big) - (n_S + n_E) e^*(\theta) = 0 \tag{♣}$$

(see expression (10) *infra*). Without additional assumptions it cannot be shown that $\Lambda(\cdot)$ has a single zero or $\Lambda(\theta) > 0$ for all θ; either of which would ensure a unique equilibrium. Uniqueness can be established given additional assumptions, such as $c(e) = e^2/2$ and states are distributed uniformly on the unit interval: given those last two assumptions, (♣) becomes

$$n_S \frac{\theta}{2} + n_E\left(\mu\chi + (1-\mu)\frac{\theta}{2}\right) - (n_S + n_E)\theta = 0\,,$$

which has a unique solution (unique zero) provided the lefthand side is not positive for all $\theta \in [0, 1]$. In other words, there is a unique equilibrium with a cutoff

$$\theta_C = \min\left\{\frac{2n_E\mu\chi}{(1+\mu)n_E + n_S}, 1\right\}.$$

implies $\Theta^{\mathbb{E}}(\theta_C) < \theta_C$. Hence,

$$n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big) \leq n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\underline{\theta}, \Theta^{\mathbb{E}}(\theta_C)\big)\Big) < (n_S + n_E) e^*(\theta_C)\,, \quad (7)$$

given that $e^*(\cdot)$ is strictly increasing. Payoffs are continuous, hence (7) contradicts the leader's wishing to make an emotional appeal for *all* $\theta < \theta_C$, as required by a cutoff strategy. *Reductio ad absurdum*, there is no equilibrium in which a leader of such limited charisma makes an emotional appeal. In this case, the equilibrium is followers believe an emotional appeal means $\theta = \underline{\theta}$ and the leader thus makes only rational appeals.

Suppose $\chi > \underline{\theta}$. There is no equilibrium in which the leader never makes an emotional appeal: even if followers believe such an appeal means $\theta = \underline{\theta}$, continuity and the fact that

$$n_S e^*(\underline{\theta}) + n_E e^*\big(\Omega(\chi, \underline{\theta})\big) > (n_S + n_E) e^*(\underline{\theta}) \quad (8)$$

mean there are states in which the leader does better to make an emotional rather than rational appeal even if her followers hold such pessimistic beliefs.

Consistency of beliefs requires $\widehat{\theta} = \Theta^{\mathbb{E}}(\theta_C)$. If

$$n_S e^*(\mathbb{E}\theta) + n_E e^*\big(\Omega(\chi, \mathbb{E}\theta)\big) < (n_S + n_E) e^*(\overline{\theta})\,, \quad (9)$$

then expressions (8), (9), and continuity imply a $\theta_C \in (\underline{\theta}, \overline{\theta})$ exists such that[17]

$$n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big) = (n_S + n_E) e^*(\theta_C)\,, \quad (10)$$

which establishes that there is an equilibrium in which an emotional appeal is made if $\theta \leq \theta_C$ and a rational appeal made otherwise. If (9) doesn't hold, then

$$n_S e^*(\mathbb{E}\theta) + n_E e^*\big(\Omega(\chi, \mathbb{E}\theta)\big) \geq (n_S + n_E) e^*(\overline{\theta})\,;$$

hence, there is an equilibrium in which the leader makes an emotional appeal regardless of the state and the followers' expectation of the state is therefore the unconditional mean. ■

The more charismatic she is, the more likely a leader is to make an emotional appeal:

Proposition 2. *Consider two leaders with levels of charisma χ' and χ, $\chi' < \chi$. Consider a perfect Bayesian equilibrium in which the χ' leader makes an emotional appeal whenever $\theta \leq \theta'_C$. Then there exists a $\theta_C \geq \theta'_C$ such that there is a perfect Bayesian equilibrium in which the χ leader makes an emotional appeal whenever $\theta \leq \theta_C$. Moreover, if $\chi > \underline{\theta}$ and $\theta'_C < \overline{\theta}$, then $\theta_C > \theta'_C$.*

[17] Recall $\underline{\theta} = \Theta^{\mathbb{E}}(\underline{\theta})$ and $\mathbb{E}\theta = \Theta^{\mathbb{E}}(\overline{\theta})$.

Proof: Ignoring the "moreover" part, the result is immediate from Proposition 1 if $\chi \leq \underline{\theta}$. Hence, assume $\chi > \underline{\theta}$. If $\chi' \leq \underline{\theta}$, then both parts of the proposition follow from Proposition 1. Hence, suppose $\chi' > \underline{\theta}$. If $\theta'_C = \overline{\theta}$, then

$$(n_S + n_E)e^*(\overline{\theta}) \leq n_S e^*(\mathbb{E}\theta) + n_E e^*\big(\Omega(\chi', \mathbb{E}\theta)\big) < n_S e^*(\mathbb{E}\theta) + n_E e^*\big(\Omega(\chi, \mathbb{E}\theta)\big)\,,$$

in which case there is an equilibrium in which θ_C also equals $\overline{\theta}$. Finally, suppose $\theta'_C < \overline{\theta}$. It follows that

$$(n_S + n_E)e^*(\theta'_C) = n_S e^*\big(\Theta^{\mathbb{E}}(\theta'_C)\big) + n_E e^*\Big(\Omega\big(\chi', \Theta^{\mathbb{E}}(\theta'_C)\big)\Big)\,.$$

Hence,

$$(n_S + n_E)e^*(\theta'_C) < n_S e^*\big(\Theta^{\mathbb{E}}(\theta'_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta'_C)\big)\Big)\,. \tag{11}$$

If

$$(n_S + n_E)e^*(\overline{\theta}) \leq n_S e^*(\mathbb{E}\theta) + n_E e^*\big(\Omega(\chi, \mathbb{E}\theta)\big)\,, \tag{12}$$

then there is an equilibrium in which $\theta_C = \overline{\theta}$, and both parts follow. If (12) doesn't hold, then that fact, (11), and continuity imply a $\theta_C \in (\theta'_C, \overline{\theta})$ exists such that

$$(n_S + n_E)e^*(\theta_C) = n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big)\,;$$

hence, there's an equilibrium in which the cutoff is θ_C and both parts follow. ■

Because there is little of interest to cases in which a leader always makes the same kind of appeal (rational or emotional) regardless of the state, θ, *assume henceforth that a leader's charisma lies in the interval* $(\underline{\chi}, \overline{\chi})$, where $\underline{\chi} = \underline{\theta}$ and

$$\overline{\chi} = \frac{1}{\mu} e^{*-1}\left(e^*(\overline{\theta}) + \frac{n_S}{n_E}\big(e^*(\overline{\theta}) - e^*(\mathbb{E}\theta)\big)\right) - \frac{1-\mu}{\mu}\mathbb{E}\theta\,.$$

Given $\chi \in (\underline{\chi}, \overline{\chi})$, there will be states in which the leader makes an emotional appeal and others in which she makes a rational appeal. *Note, critically, this means the antecedent in the last sentence of Proposition 2 always holds.*

Next, a leader with more charisma induces greater effort from *both* kinds of followers using an emotional appeal than does a less charismatic leader:

Proposition 3. *For any perfect Bayesian equilibrium of the game with a less charismatic leader, there is a perfect Bayesian equilibrium of the game with a more charismatic leader such that, comparing the equilibria,* both *emotional and sober responders supply greater effort in response to an emotional appeal from the more charismatic leader than they do in response to such an appeal from the less charismatic leader.*

Proof: Consider two charisma levels, $\chi > \chi'$. From Proposition 2, if θ'_C is the equilibrium cutoff with a leader of charisma χ', then there is an equilibrium with cutoff $\theta_C > \theta'_C$ in the game with the more charismatic leader. Because $\Theta^{\mathbb{E}}(\cdot)$ is increasing, it follows that

$$e^*\left(\Theta^{\mathbb{E}}(\theta_C)\right) > e^*\left(\Theta^{\mathbb{E}}(\theta'_C)\right)$$
$$\text{and } e^*\big(\mu\chi + (1-\mu)\Theta^{\mathbb{E}}(\theta_C)\big) > e^*\big(\mu\chi' + (1-\mu)\Theta^{\mathbb{E}}(\theta'_C)\big)\,,$$

which establishes the claim for sober and emotional responders, respectively. ■

The effect of greater charisma on emotional responders is not surprising. What is more interesting is that sober responders—those not inherently receptive to emotional appeals—respond more to such appeals in equilibrium when they come from more charismatic leaders than when they come from less charismatic leaders. The reason is that more charismatic leaders know they have a greater influence on emotional responders than less charismatic leaders; hence, more charismatic leaders are willing to make emotional appeals for a wider range of states than less charismatic leaders. Consequently, sober responders rationally infer that the state is likely to be greater when they receive an emotional appeal from a more charismatic leader than when they receive such an appeal from a less charismatic leader, which causes them to expend more effort.

Of arguably greater importance is the effect of differences in leaders' charisma on *expected* effort supply and the expected value of the public good. As a preliminary step in that analysis: because charisma lies in the interval $(\underline{\chi}, \overline{\chi})$, the leader is indifferent between the two kinds of appeal if the state exactly equals her cutoff, θ_C. This means

$$n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big) = N e^*(\theta_C)\,. \tag{13}$$

The following is then readily shown.

Proposition 4. *Consider leaders with charisma χ' and χ, $\chi' < \chi$. For any perfect Bayesian equilibrium of the game with the less charismatic leader (χ'), there is a perfect Bayesian equilibrium of the game with the more charismatic leader (χ) in which, comparing the two equilibria,*

(i) expected total effort supplied by the followers is greater if the leader is the more charismatic of the two rather than the less charismatic; and

(ii) the expected value of the public good is greater if the leader is the more charismatic of the two rather than the less charismatic.

Proof: Consider any equilibrium with the less charismatic leader and corresponding cutoff θ'_C. From Proposition 2, there is an equilibrium of the game with the more charismatic leader such that the cutoff, θ_C, is greater (*i.e.,* $\theta_C > \theta'_C$). Let $F(\cdot)$ denote the distribution function over states and $\Upsilon : [\underline{\theta}, \overline{\theta}] \to \mathbb{R}_{++}$ (more

on $\Upsilon(\cdot)$ later). To see how outcomes vary between the two leaders, observe that

$$\begin{aligned}
&\int_{\underline{\theta}}^{\theta_C} \Upsilon(\theta) N e^*(\theta_C) dF(\theta) + \int_{\theta_C}^{\overline{\theta}} \Upsilon(\theta) N e^*(\theta) dF(\theta) \\
&> \int_{\underline{\theta}}^{\theta'_C} \Upsilon(\theta) N e^*(\theta_C) dF(\theta) + \int_{\theta'_C}^{\theta_C} \Upsilon(\theta) N e^*(\theta) dF(\theta) + \int_{\theta_C}^{\overline{\theta}} \Upsilon(\theta) N e^*(\theta) dF(\theta) \\
&> \int_{\underline{\theta}}^{\theta'_C} \Upsilon(\theta) N e^*(\theta'_C) dF(\theta) + \int_{\theta'_C}^{\overline{\theta}} \Upsilon(\theta) N e^*(\theta) dF(\theta) \,,
\end{aligned}$$

where the first inequality follows because, for $\theta < \theta_C$, a leader with charisma χ strictly prefers an emotional appeal to a rational appeal and the second because $e^*(\cdot)$ is strictly increasing. Setting $\Upsilon(\theta) \equiv 1$, this chain shows that expected effort with a more charismatic leader—the first line in the chain—strictly exceeds expected effort with a less charismatic leader—the last line in the chain. Letting $\Upsilon(\theta) = \theta$, the chain shows that expected value with a more charismatic leader is greater than with a less charismatic leader. ■

Proposition 4 provides insight into why the designers of an organization could prefer a more charismatic leader to a less charismatic leader (*e.g.,* choose Kirk over Spock): provided the organization has *any* emotional responders who are the least bit receptive to emotional appeals (*i.e.,* provided $n_E > 0$ and $\mu > 0$), a more charismatic leader will generate more effort and greater value in expectation than a less charismatic leader.

The analysis has so far allowed for the possibility that multiple equilibria exist. Although uniqueness is not required, the analysis is more concise if equilibria are unique. To that end, *assume henceforth* that the disutility-of-effort function, $c(\cdot)$, and the distribution over states, $F(\cdot)$, are such that the function $\Lambda(\cdot)$, defined as the mapping

$$\theta \mapsto n_S e^*\big(\Theta^{\mathbb{E}}(\theta)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta)\big)\Big) - N e^*(\theta) \,, \tag{14}$$

has a unique zero for each $\chi \in (\underline{\chi}, \overline{\chi})$; that is, for each χ, there is only one θ_C such that $\Lambda(\theta_C) = 0$.[18] Note this defines θ_C as an implicit function of χ and, moreover, by the implicit function theorem, $d\theta_C/d\chi$ exists for all $\chi \in (\underline{\chi}, \overline{\chi})$.

4 Savvy Leaders, Demagogues, and Professors

So far, the assumption has been the leader knows the state, θ, and is able to tailor her appeal so to maximize the public good given how her followers respond to different appeals. Call such a leader *savvy*. In this section, two alternative kinds of leaders, "demagogues" and "professors," will be considered.

[18] Recall the discussion in footnote 16 *supra*.

In contrast to a savvy leader, suppose a leader either had no charisma ($\chi = \underline{\chi}$) or, equivalently, was known to be unwilling to ever make an emotional appeal. Call such a leader a *professor*. In terms of inducing effort and creating value, a professor is inferior to a savvy leader (Proposition 4).

At the other extreme, suppose the leader does not know θ. Such a leader—call her a *demagogue*—can make emotional appeals only.[19] Consequently, her followers can infer nothing about the state from her "decision" to make an emotional appeal and, thus, their inferences about the state are independent of her charisma. In particular, sober responders always supply effort $e^*(\mathbb{E}\theta)$.

The difference between professors and demagogues has to do with the value of information. The following lemma is critical in that regard.

Lemma 1. *Consider the functions defined by* $\theta \mapsto \theta e^*(\theta) - c\big(e^*(\theta)\big)$ *and* $\theta \mapsto \theta e^*(\theta)$.

(i) The first function is strictly convex.

(ii) If, for all $e \in \mathbb{R}_+$, marginal *disutility of effort is log concave (i.e.,* $\log\big(c'(\cdot)\big)$ *is concave), then the second function is strictly convex.*

Log concavity is satisfied, for example, if $c(e) = \omega e^\gamma$, where, consistent with the assumptions of Section 2, $\omega > 0$ and $\gamma > 1$.[20] *Assume, henceforth, that* marginal *disutility is log concave* (does not accelerate too quickly).

Given the lemma, Jensen's inequality entails that

$$\mathbb{E}\big\{\theta e^*(\theta)\big\} > \mathbb{E}\theta \times e^*(\mathbb{E}\theta) = \mathbb{E}\big\{\theta e^*(\mathbb{E}\theta)\big\}\,;$$

that is, information about the state is valuable insofar as an informed follower produces more in expectation than an uninformed follower (a follower who knows only the prior). Consequently, a professor generates greater expected value from sober responders than a demagogue. Hence, if a demagogue's charisma is low enough, or emotional responders a small enough minority of followers, or both, then a professor will generate greater expected value in total. On the other hand, letting $c(e) = e^2/2$ and assuming θ is distributed uniformly on the unit interval, we have

$$\mathbb{E}\big\{\theta e^*(\theta)\big\} = \mathbb{E}\{\theta^2\} = \frac{1}{3} < \frac{1}{2} = \mathbb{E}\theta \times e^*(1)\,;$$

hence, if the demagogue is sufficiently charismatic and the emotional responders sufficiently responsive to emotional appeals (*i.e.,* μ is large), then she will generate greater expected value from emotional responders than a professor. If, in addition, the number of emotional responders is large relative to the number of sober responders, then she must generate greater expected value in total than would a professor. To conclude:

[19] She could, plausibly, also remain silent. If her charisma is less than $\mathbb{E}\theta$ and silence is equivalent to a rational appeal corresponding to that prior expectation of θ, then she would, in fact, wish to remain silent. The analysis that follows holds independently of whether the leader has the ability to remain silent.

[20] Proof: $\log\big(c'(e)\big) = (\gamma - 1)\log(e) + \log(\omega\gamma)$, which is clearly concave in e.

Proposition 5. *It is ambiguous as to whether a professor generates more or less value in expectation than a demagogue. That is, there exist conditions under which the professor generates greater value in expectation and conditions under which the demagogue does.*

5 Welfare and the Democratic Choice of Leader

As an entree to issues of welfare and who the followers want as leader, suppose that all responders are sober (*i.e.,* $n_E = 0$). Because $\Theta^{\mathbb{E}}(\theta_C) < \theta_C$, unless $\theta_C = \underline{\theta}$, expression (6) implies that a savvy leader facing only sober responders will never make an emotional appeal. Hence, her charisma is irrelevant.

Given Lemma 1, the function

$$\theta \mapsto (n_S - 1)\theta e^*(\theta) + \theta e^*(\theta) - c\big(e^*(\theta)\big)$$

is strictly convex. Hence, Jensen's inequality implies

$$\mathbb{E}\Big\{n_S\theta e^*(\theta) - c\big(e^*(\theta)\big)\Big\} > n_S \times \mathbb{E}\theta \times e^*(\mathbb{E}\theta) - c\big(e^*(\mathbb{E}\theta)\big)\,. \tag{15}$$

Hence, if all followers are sober, each strictly prefers a professor or savvy leader to a demagogue. Scaling (15) by n_S shows that, if all followers are sober, their expected welfare is greater with a professor or savvy leader than with a demagogue. To summarize:

Proposition 6. *If all followers are sober responders, then each follower prefers a professor or savvy leader to a demagogue and their expected welfare is greater with such a leader than with a demagogue. When choosing between two leaders, charisma is irrelevant when all followers are sober responders.*

Now suppose that there are both sober and emotional responders. The presence of emotional responders causes sober responders to care about the charisma of leaders; in particular, sober responders will strictly prefer savvy leaders to professors and, in addition, more charismatic savvy leaders to less charismatic savvy leaders:

Proposition 7. *Assume there are sober and emotional responders and leaders are savvy, then sober responders prefer a more charismatic leader to a less charismatic leader.*

Proof: The expected payoff to a sober responder is

$$F(\theta_C)\Theta^{\mathbb{E}}(\theta_C)\left(n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big)\right) - F(\theta_C)c\Big(e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big)\Big)$$
$$+ \int_{\theta_C}^{\overline{\theta}} \Big(\theta(n_S + n_E)e^*(\theta) - c\big(e^*(\theta)\big)\Big)dF(\theta)\,. \tag{16}$$

Using (i) $d\big(F(\theta_C)\Theta^{\mathbb{E}}(\theta_C)\big)/d\theta_C = \theta_C F'(\theta_C)$, (ii) expression (13), and (iii) the envelope theorem, it can be seen that the derivative of (16) with respect to χ is

$$F'(\theta_C)\left(c\big(e^*(\theta_C)\big) - c\Big(e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big)\Big)\right)$$
$$+ n_E e^{*\prime}\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big)\left(\mu + (1-\mu)\Theta^{\mathbb{E}\,\prime}(\theta_C)\frac{d\theta_C}{d\chi}\right)\Theta^{\mathbb{E}}(\theta_C)F(\theta_C)$$
$$+ (n_S - 1)e^{*\prime}\big(\Theta^{\mathbb{E}}(\theta_C)\big)\Theta^{\mathbb{E}\,\prime}(\theta_C)\frac{d\theta_C}{d\chi}\Theta^{\mathbb{E}}(\theta_C)F(\theta_C) > 0$$

(the sign follows because $\theta_C > \Theta^{\mathbb{E}}(\theta_C)$, $d\theta_C/d\chi > 0$, and $e^{*\prime}(\cdot) > 0$). ■

Corollary 1. *Assume there are sober and emotional responders, then sober responders prefer a sufficiently charismatic demagogue to a professor.*

Proof: Consider a savvy leader with charisma $\overline{\chi}$: she always makes an emotional appeal and is, thus, equivalent to a demagogue of equal charisma. A professor is a savvy leader who lacks charisma. The result follows from Proposition 7 and the continuity of payoffs. ■

Although sober responders prefer a sufficiently charismatic demagogue to a professor, a professor is preferable to a demagogue with little charisma:

Proposition 8. *Assume there are sober and emotional responders, then sober responders will prefer a professor to an insufficiently charismatic demagogue.*

Proof: Let $\theta_\ell = \underline{\theta}$ if a demagogue must make an appeal and let it equal $\mathbb{E}\theta$ if she can be silent. Observe

$$\mathbb{E}\Big\{(n_S + n_E)\theta e^*(\theta) - c\big(e^*(\theta)\big)\Big\} > (n_S + n_E) \times \mathbb{E}\theta \times e^*(\mathbb{E}\theta) - c\big(e^*(\mathbb{E}\theta)\big)$$
$$\geq \mathbb{E}\theta \times \Big(n_S e^*(\mathbb{E}\theta) + n_E e^*\big(\Omega(\theta_\ell, \mathbb{E}\theta)\big)\Big) - c\big(e^*(\mathbb{E}\theta)\big)\,, \quad (17)$$

where the first inequality follows from Lemma 1 and the second because $\mathbb{E}\theta \geq \Omega(\theta_\ell, \mathbb{E}\theta)$. The first expression in (17) is a sober responder's expected payoff under a professor, the last his expected payoff under a demagogue with charisma $\chi = \theta_\ell$. The result follows given continuity of payoffs. ■

What about the preferences of emotional responders concerning the choice of leader? The answer is complicated and depends on the following: are the true payoffs of emotional responders given by expression (3) or do those responders merely behave as if that is their payoff? If the former, what is U? If the latter, what are their true payoffs? Also, if the latter, how aware are they that their behavior is or will be at odds with their true payoffs? Those questions engender far more possibilities to consider than can be dealt with in the limited space of a journal article; consequently, only a few cases will be examined:

1. Unaware, naïve emotional responders, whose true payoff is given by (2): each individual emotional responder believes himself to be sober, but may or may not believe some subset of his fellow followers are emotional responders.

2. Aware, naïve emotional responders, whose true payoff is given by (2): each such responder knows he is an emotional responder. In both this case and the previous one, assume $\mu = 1$ in (3).

3. Identifying emotional responders, whose true payoff is

$$\mu\chi + (1-\mu)V - c(e_m) \tag{18}$$

given an emotional appeal and is (2) given a rational appeal. In this case, emotional responders know their utility (payoffs). Assume $\mu \in (0,1)$.

In case #1, emotional responders' preferences over leaders weakly mimic sober responders': if they believe all responders are sober, then they are indifferent to charisma and prefer professors to demagogues (Proposition 6); but if they believe that *other* followers are emotional, then they will favor a more charismatic savvy leader to a less charismatic savvy leader (Proposition 7). In terms of such a follower's expected utility, it is

$$\int_{\underline{\theta}}^{\theta_C} \left(\theta\Big(n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*(\chi) \Big) - c\big(e^*(\chi)\big) \right) dF(\theta) + \int_{\theta_C}^{\overline{\theta}} \Big(\theta(n_S + n_E) e^*(\theta) - c\big(e^*(\theta)\big) \Big) dF(\theta) \tag{19}$$

(recall $\mu = 1$). Differentiating (19) with respect to χ, utilizing (13) and the envelope theorem, yields

$$\underbrace{F'(\theta_C)\Big(c\big(e^*(\theta_C)\big) - c\big(e^*(\chi)\big) \Big)}_{\mathsf{X}} + \underbrace{\left((n_E - 1) e^{*\prime}(\chi) + n_S e^{*\prime}\big(\Theta^{\mathbb{E}}(\theta_C)\big) \Theta^{\mathbb{E}\,\prime}(\theta_C) \frac{d\theta_C}{d\chi} \right) \Theta^{\mathbb{E}}(\theta_C) F(\theta_C)}_{\mathsf{A}}, \tag{20}$$

where the term labeled X reflects the amount by which such a follower is being exploited and is, thus, a loss to the follower; and the term label A reflects the additional production that a more charismatic leader generates from the *other* followers and is, thus, a positive to the follower. If n_E and n_S are sufficiently large, then $\mathsf{A} + \mathsf{X} > 0$: even a naïve emotional responder is better off with a more charismatic leader than a less charismatic leader. Given (20) equals X if $n_E = 1$ and $n_S = 0$, conditions also exist such that a naïve emotional responder would be better off with a less charismatic leader.

In case #2, emotional responders are aware of their vulnerability to charisma. Whether they want a more or less charismatic leader depends on the sign of (20). If the sign is negative, then, ironically, it is the sober responders—those not directly affected by charisma—who favor a more charismatic leader, while emotional responders—those directly affected by charisma—favor a less charismatic leader. Such a difference in preferences reflects the latter's fear of being exploited and the former's benefits from such exploitation.

In case #3, the derivative of the emotional responders' utility with respect to charisma has the X and A terms (modified to reflect $\mu < 1$), but there is also the additional term

$$-\theta_C F'(\theta_C)\mu\left(n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big)\right) < 0\,.$$

As with case #2, it is ambiguous as to whether such emotional responders would favor a more or less charismatic leader.

6 Endogenous Demagogues

So far, the assumption has been that the leader is endowed with knowledge of the state, θ. This section explores the alternative that she must invest some fixed amount, $I > 0$, in order to learn about θ. Whether or not she invests is a hidden action.

In what follows, assume that a leader who obtains information is savvy. If she fails to obtain information, then she has no choice but to act as a demagogue (*i.e.,* make emotional appeals only). Because θ affects payoffs in an affine manner, little is gained by assuming the leader receives a signal of θ rather than learning θ itself. Additionally, while one could conceive of her investment revealing θ with less than certainty, that generalization complicates the analysis without yielding particularly useful insights. In sum, then, assume that the leader learns θ with certainty if she invests I; and she learns nothing about it if she doesn't. Her payoffs are $V - I$ and V, respectively.

Suppose the followers expect the leader to invest. Her expected payoff (gross of investment cost) if she indeed does is

$$\mathbb{E}V_I \equiv \int_{\underline{\theta}}^{\theta_C} \theta N e^*(\theta_C) dF(\theta) + \int_{\theta_C}^{\overline{\theta}} \theta N e^*(\theta) dF(\theta)$$

(note the use of (13)). If she deviates by not investing, her expected payoff is

$$\mathbb{E}V_{\neg I} \equiv \int_{\underline{\theta}}^{\overline{\theta}} \theta N e^*(\theta_C) dF(\theta)\,.$$

The difference is

$$\Delta(\theta_C) \equiv \mathbb{E}V_I - \mathbb{E}V_{\neg I} = \int_{\theta_C}^{\overline{\theta}} \theta N\big(e^*(\theta) - e^*(\theta_C)\big) dF(\theta)\,. \tag{21}$$

If $\theta_C = \overline{\theta}$, then $\Delta(\theta_C) = 0$; if $\theta_C < \overline{\theta}$, then $\Delta(\theta_C) > 0$. Because no leader would invest otherwise, assume $\Delta(\underline{\theta}) > I$.

By continuity, there exists a $\theta_D \in (\underline{\theta}, \overline{\theta})$ such that $\Delta(\theta_D) = I$. From (21), $\Delta(\cdot)$ is decreasing, so θ_D is unique. Moreover, because (i) $\theta_C = \underline{\theta}$ for a leader with charisma $\underline{\chi}$; (ii) $\theta_C = \overline{\theta}$ for a leader with charisma $\overline{\chi}$; and (iii) θ_C is continuous and increasing in charisma (Proposition 2 and the assumption that $\Lambda(\cdot)$, as defined by (14), has a unique zero), there exists a unique charisma level χ_D, $\chi_D \in (\underline{\chi}, \overline{\chi})$, such that there is no equilibrium in which a leader with charisma greater that χ_D invests in learning the state.

Suppose, instead, the followers expect the leader *not* to invest. In other words, they expect the leader to behave as a demagogue; hence, a sober responder will choose effort $e^*(\mathbb{E}\theta)$ in response to the expected emotional appeal and an emotional responder effort $e^*\big(\Omega(\chi, \mathbb{E}\theta)\big)$.[21] Because $\chi < \overline{\chi}$, there exists a $\widetilde{\theta} \in (\underline{\theta}, \overline{\theta})$ such that

$$Ne^*(\widetilde{\theta}) = n_S e^*(\mathbb{E}\theta) + n_E e^*\big(\Omega(\chi, \mathbb{E}\theta)\big)\,.$$

Consequently, the leader's expected payoff if she indeed does not invest is

$$\mathbb{E}\widetilde{V}_{\neg I} \equiv \int_{\underline{\theta}}^{\overline{\theta}} \theta N e^*(\widetilde{\theta}) dF(\theta)\,.$$

If she deviates by investing, her expected payoff (gross of investment cost) is

$$\mathbb{E}\widetilde{V}_I \equiv \int_{\underline{\theta}}^{\widetilde{\theta}} \theta N e^*(\widetilde{\theta}) dF(\theta) + \int_{\widetilde{\theta}}^{\overline{\theta}} \theta N e^*(\theta) dF(\theta)\,.$$

The difference is $\Delta(\widetilde{\theta})$.

Because $\chi < \overline{\chi}$, $\theta_C < \overline{\theta}$; hence, $\Theta^{\mathbb{E}}(\theta_C) < \mathbb{E}\theta$. It follows, therefore, that $\widetilde{\theta} > \theta_C$ and, thus, that $\Delta(\widetilde{\theta}) < \Delta(\theta_C)$. Consequently, if a leader of a given charisma would deviate from investing when expected to invest, then she would *not* deviate from not investing when expected not to invest. To summarize the preceding analysis:

Proposition 9. *There is a pure-strategy perfect Bayesian equilibrium of the game in which the leader decides whether to invest in learning the payoff-relevant state, θ, such that a leader with charisma not exceeding a threshold χ_D, $\chi_D \in (\underline{\chi}, \overline{\chi})$, will invest, but a leader with charisma above that threshold will not.*

Another way to state Proposition 9 is

Corollary 2. *When the leader can decide whether to become informed, a sufficiently charismatic leader will choose to be a demagogue in equilibrium.*

[21] The presumption is the leader *must* make an appeal (cannot be silent). The results, though, are not dependent on this: if silence meant both kinds of responders played $e^*(\mathbb{E}\theta)$, then the quantity $\widetilde{\theta}$, shortly to be introduced, would only be greater. It would thus continue to be true that $\Delta(\widetilde{\theta}) < \Delta(\theta_C)$, which is all that is required to establish Proposition 9 *infra*.

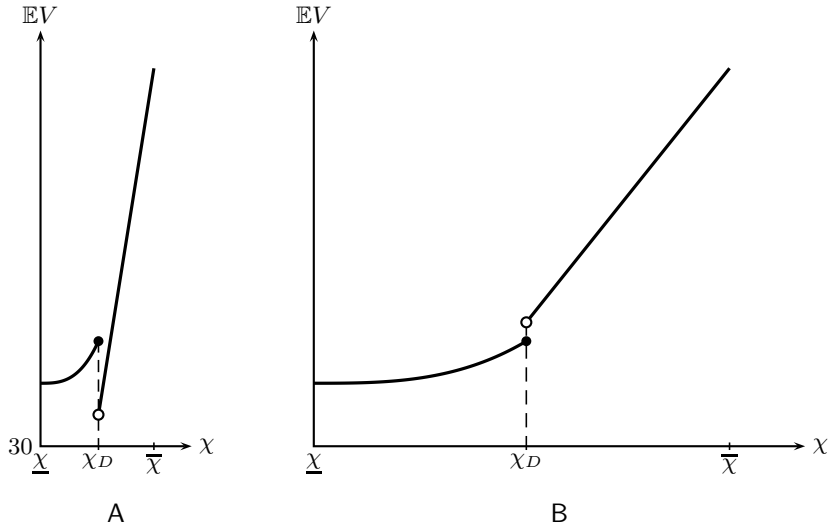


Figure 1: Expected value (expression (22)) as a function of the leader's charisma when the leader's decision to learn the state is endogenous. Horizontal & vertical axes not on the same scale. See text for the parameter values and functional forms being assumed. In panel A, the number of sober and emotional responders is equal; in panel B, 90% are sober responders.

Because $\widetilde{\theta} > \theta_C$ for any level of charisma, the equilibrium of Proposition 9 is not unique: there is a lower threshold, $\widetilde{\chi}_D$, such that, if the followers expect a leader with charisma $\chi \in (\widetilde{\chi}_D, \overline{\chi})$ not to invest, it is indeed a best response for such a leader not to invest. In other words, for any $\widehat{\chi} \in [\widetilde{\chi}_D, \chi_D]$ there is a pure-strategy equilibrium such that leaders with charisma less than $\widehat{\chi}$ invest and those with greater charisma don't. For the sake of brevity, however, attention will be limited to the Proposition 9 equilibrium.

In the Proposition 9 equilibrium, the public good's expected value, $\mathbb{E}V$, is

$$\mathbb{E}V = \begin{cases} \int_{\underline{\theta}}^{\theta_C} \theta N e^*(\theta_C) dF(\theta) + \int_{\theta_C}^{\overline{\theta}} \theta N e^*(\theta) dF(\theta)\,, \text{ if } \chi \leq \chi_D \\ \Big(n_S e^*(\mathbb{E}\theta) + n_E e^*\big(\Omega(\chi, \mathbb{E}\theta)\big)\Big)\mathbb{E}\theta\,, \text{ if } \chi > \chi_D \end{cases} . \tag{22}$$

Unlike Proposition 4, in which $\mathbb{E}V$ was strictly increasing in the leader's charisma, $\mathbb{E}V$ may not be monotone in charisma when the leader can decide whether to learn the state. Figure 1 plots expression (22) under two different scenarios. Common to both scenarios: $c(e) = e^2/2$, θ distributed uniformly on the unit interval, $\mu = 1$, and $N/I = 10$. In panel A of the figure, it is assumed that the number of sober and emotional responders is the same. In panel B, 90% of the followers are sober responders. In the first scenario, this entails $\overline{\chi} = 3/2$ and $\chi_D \approx .767$. In the second, $\overline{\chi} = 11/2$ and $\chi_D \approx 2.81$.

The ambiguity shown in the figure arises from two offsetting effects. On one hand, if the leader remains uninformed in equilibrium, then the organization is without valuable information (Lemma 1(ii) means sober responders yield greater value in expectation when informed than when not). On the other, because the leader can effectively commit to be ignorant, the followers' inference about the state given an emotional appeal is less pessimistic than it would be if the leader could strategically reveal or conceal information (necessarily, $\mathbb{E}\theta > \Theta^{\mathbb{E}}(\theta_C)$). When there are relatively many emotional responders, the leader is more inclined to make an emotional appeal than when there are relatively few (see, *e.g.,* the formula for θ_C in footnote 16). Hence, followers will already have less cause to be pessimistic upon receiving an emotional appeal, which means the loss-of-information effect dominates the reduced-pessimism effect, as seen in Panel A of Figure 1. The reverse is true when emotional responders are relatively rare, as seen in Panel B of Figure 1.

In light of Figure 1, it is not surprising that sober responders' preferences for leaders with different *intermediate* levels of charisma could be ambiguous. What is unambiguous, though, is that they still prefer sufficiently charismatic leaders: as $\chi \to \overline{\chi}$, the endogeneity of the information becomes irrelevant—even if informed, such a leader will almost surely make an emotional appeal and Proposition 7 already tells us that sober responders most prefer a *maximally* charismatic leader despite her never revealing the state.

Given the discussion at the end of the previous section, as well as here, it is clear that the preferences of emotional responders with respect to their leaders' charisma are ambiguous when information acquisition is endogenous.

7 Charisma and a Leader's Direct Work Incentives

So far the productivity state, θ, has been chosen by "nature." This section considers the possibility that it is, instead, determined by the leader's actions. Specifically, assume she chooses θ from $[\underline{\theta}, \infty)$. To ensure interior solutions, assume $\underline{\theta} > 0$ (*i.e.,* even absent action by the leader, there is some return to the followers' efforts). Choosing θ means the leader suffers disutility $\delta(\theta)$. Hence, her utility is

$$\theta N e^*(\theta) - \delta(\theta) \tag{23}$$

if she makes a rational appeal and

$$\theta\Big(n_S e^*(\widehat{\theta}) + n_E e^*\big(\Omega(\chi, \widehat{\theta})\big)\Big) - \delta(\theta) \tag{24}$$

if she makes an emotional appeal, where $\widehat{\theta}$ denotes the θ the followers believe she chose. The leader's choice of θ is her private information, unless she chooses to reveal it via a rational appeal. As before, her knowledge of θ is hard: she can conceal it (make an emotional appeal), but cannot distort it.

For ease of analysis and to ensure interior optima and unique equilibria, assume that $\delta(\cdot)$ exhibits the following properties:[22] $\delta(\cdot)$ is twice continuously

[22]These properties would be satisfied, for example, if $c(e) = e^2/2$ and $\delta(\theta) = (\theta - \underline{\theta})^3/3$.

differentiable; $\delta(\underline{\theta}) = \delta'(\underline{\theta}) = 0$; $\delta'(\cdot)$ is strictly increasing (*i.e.,* $\delta(\cdot)$ is convex) and unbounded above; for all levels of charisma, χ, the function defined by

$$\theta \mapsto n_S e^*(\theta) + n_E e^*\big(\Omega(\chi, \theta)\big)$$

intersects $\delta'(\cdot)$ once on $[\underline{\theta}, \infty)$; and the function defined by

$$\theta \mapsto N e^*(\theta) + N\theta e^{*\prime}(\theta)$$

intersects $\delta'(\cdot)$ once on $[\underline{\theta}, \infty)$. Because $\underline{\theta} > 0$, $e^*(\theta) > 0$; hence, the two functions just defined cross $\delta'(\cdot)$ from above.

The timing of the game is similar to before: the leader chooses θ; she then decides the kind of appeal; finally followers choose their efforts in response.

If the leader plans to make a rational appeal, then she will choose θ to maximize (23). The assumptions just made ensure that program has a unique solution, call it θ^*_{RA}.

If she plans to make an emotional appeal, then she will choose θ to maximize (24). The first-order condition is

$$n_S e^*(\widehat{\theta}) + n_E e^*\big(\Omega(\chi, \widehat{\theta})\big) = \delta'(\theta)\,.$$

Given the properties of $\delta(\cdot)$, there is a unique solution and it defines a maximum. In equilibrium, the followers' expectations must be correct; that is, the solution must be $\widehat{\theta}$. Mathematically, in equilibrium, it will be that

$$n_S e^*(\widehat{\theta}) + n_E e^*\big(\Omega(\chi, \widehat{\theta})\big) = \delta'(\widehat{\theta})\,. \tag{25}$$

By assumption, there is a unique $\widehat{\theta}$ that solves (25) for each level of charisma; call it $\widehat{\theta}(\chi)$. Because an increase in charisma, holding $\widehat{\theta}$ constant, shifts the lefthand side of (25) up and that curve intersects $\delta'(\cdot)$, an increasing function, from above, $\widehat{\theta}(\cdot)$ must be an increasing function. Hence:

Proposition 10. Conditional on her ultimately making an emotional appeal*, a leader works harder—generates a higher productivity parameter—the more charismatic she is.*

Intuitively, a more charismatic leader knows she will generate more effort from emotional responders *ceteris paribus*; hence, her return to increasing θ is greater. Followers understand this, so expect a higher θ, which means they will supply greater effort, which reinforces her incentives to choose a higher θ.

If, contrary to the maintained assumption of this section, leaders were demagogues only (unable to make rational appeals),[23] then a corollary to Proposition 10 would be

Corollary 3. *If leaders are demagogues and leaders determine the productivity parameter, θ, then more charismatic leaders work harder in equilibrium than less charismatic leaders.*

[23]This could hold if θ were *soft* information and there was no scope for the leader to signal its value.

The focus, however, is on savvy leaders. If the range of possible charisma levels is $[\underline{\theta}, \infty)$ (*i.e.,* $\underline{\chi} = \underline{\theta}$), then sufficiently uncharismatic leaders will prefer to make rational appeals rather than emotional ones. The reason is as follows. Necessarily, $\underline{\theta} \leq \widehat{\theta}$. In fact, because $\delta'(\underline{\theta}) = 0$ and $e^*(\underline{\theta}) > 0$, it follows that

$$n_S e^*(\underline{\theta}) + n_E e^*\big(\Omega(\underline{\theta}, \underline{\theta})\big) > 0 = \delta'(\underline{\theta})\,.$$

Consequently, it must be that $\widehat{\theta}(\underline{\theta}) > \underline{\theta}$. Hence,

$$\widehat{\theta}(\underline{\theta}) N e^*\big(\widehat{\theta}(\underline{\theta})\big) > \widehat{\theta}(\underline{\theta})\Big(n_S e^*(\widehat{\theta}(\underline{\theta})) + n_E e^*\big(\Omega(\underline{\theta}, \widehat{\theta}(\underline{\theta}))\big)\Big)\,;$$

which means that a leader of minimum charisma (*i.e.,* $\chi = \underline{\theta}$), even if she chose productivity level $\widehat{\theta}(\underline{\theta})$, would do better to deviate by making a rational appeal. Of course, if she will make a rational appeal, she does best to choose θ^*_{RA}. This logic extends to any leader whose charisma is such that $\chi < \widehat{\theta}(\chi)$: she does better to choose θ^*_{RA} and make a rational appeal. Given continuity, the interval of such types is non-empty. To conclude:

Proposition 11. *In any perfect Bayesian equilibrium, leaders with sufficiently low charisma will choose productivity parameter θ^*_{RA} and make rational appeals. The set of charisma levels for which this is true is non-empty.*

Consider the other extreme. By the implicit function theorem, $\widehat{\theta}(\cdot)$ is differentiable. Invoking the envelope theorem, the derivative, with respect to charisma, of the equilibrium payoff enjoyed by a leader who makes an emotional appeal is

$$\widehat{\theta}(\chi)\left(n_S e^{*\prime}\big(\widehat{\theta}(\chi)\big)\widehat{\theta}'(\chi) + n_E e^{*\prime}\Big(\Omega\big(\chi, \widehat{\theta}(\chi)\big)\Big)\frac{d\Omega}{d\chi}\right)\,,$$

which is positive and bounded away from zero. Consequently, for sufficiently high levels of charisma, the equilibrium payoff enjoyed by a leader who will make an emotional appeal must exceed the maximized value of (23). This and the previous analysis establish:

Proposition 12. *If the levels of charisma are $[\underline{\theta}, \infty)$, then there exists a finite $\widehat{\chi} > \underline{\theta}$ such that there is a perfect Bayesian equilibrium in which leaders with charisma below $\widehat{\chi}$ choose productivity θ^*_{RA} and make rational appeals and leaders with charisma above $\widehat{\chi}$ choose productivity $\widehat{\theta}(\chi)$ and make emotional appeals. The beliefs of the followers on hearing an emotional appeal from a leader of charisma χ is that she chose effort $\widehat{\theta}(\chi)$.*

Because Bayes Rule pins down beliefs on the equilibrium path only, one could construct other perfect Bayesian equilibria in which the followers "threaten" to hold very pessimistic beliefs about θ if a leader with charisma below χ^+, $\chi^+ > \widehat{\chi}$, makes an emotional appeal (*e.g.,* they believe $\theta = \underline{\theta}$). These other equilibria are,

however, not robust to certain forward-induction arguments.[24] For that reason, as well as brevity, attention will be limited to the Proposition 12 equilibrium.

Consider a leader whose charisma makes her indifferent between a rational-appeal strategy and an emotional-appeal strategy (*i.e.,* her charisma is precisely $\widehat{\chi}$, as defined in Proposition 12). Would she choose a greater productivity parameter if she plans on subsequently making a rational appeal or would it be greater if she plans on an emotional appeal (*i.e.,* is θ^*_{RA} greater or less than $\widehat{\theta}(\widehat{\chi})$)? Further, which strategy will yield the greater value, V, of the public good? Given the monotonicity of $\delta(\cdot)$, the answer to the second question follows immediately from the answer to the first: given her indifference,

$$\underbrace{\theta^*_{\text{RA}} N e^*(\theta^*_{\text{RA}})}_{V_{\text{RA}}} - \delta(\theta^*_{\text{RA}}) = \underbrace{\widehat{\theta}(\widehat{\chi})\Big(n_S e^*(\widehat{\theta}(\widehat{\chi})) + n_E e^*\big(\Omega(\widehat{\chi}, \widehat{\theta}(\widehat{\chi}))\big)\Big)}_{V_{\text{EA}}(\widehat{\chi})} - \delta\big(\widehat{\theta}(\widehat{\chi})\big)\,. \quad (26)$$

Hence, $\theta^*_{\text{RA}} > \widehat{\theta}(\widehat{\chi})$ if and only if $V_{\text{RA}} > V_{\text{EA}}(\widehat{\chi})$.

Lemma 2. *For $\widehat{\chi}$ defined in Proposition 12, $\theta^*_{\text{RA}} > \widehat{\theta}(\widehat{\chi})$.*

Because $\widehat{\theta}(\cdot)$ and the other relevant functions are continuous, Lemma 2 implies

Proposition 13. *There exist charisma levels $\widehat{\chi}$ and $\widetilde{\chi}$, with $\underline{\theta} < \widehat{\chi} < \widetilde{\chi}$, such that the organization is better off (V is greater) if the leader's charisma is less than $\widehat{\chi}$ than if it falls in the interval $(\widehat{\chi}, \widetilde{\chi})$; that is, the organization's wellbeing is* not *monotone in its leader's charisma.*

Because $V_{\text{EA}}(\cdot)$ is unbounded above, the cutoff $\widetilde{\chi}$ in Proposition 13 is finite: for sufficiently high levels of charisma, a charismatic leader is better than an uncharismatic leader and, in addition, at those high levels of charisma more charisma is better than less (Proposition 10). Figure 2 illustrates one possible scenario.

[24] For instance, suppose the equilibrium were that all charisma types less than χ^+, $\chi^+ > \widehat{\chi}$, made rational appeals and followers believed an emotional appeal from such a leader meant $\theta = \underline{\theta}$. Consider the Cho and Kreps (1987)-like speech a leader with charisma $\chi \in (\widehat{\chi}, \chi^+)$ might make if she deviates by making an emotional appeal: "I have deviated, but you should not believe I chose $\underline{\theta}$, because to have done so would make me worse off than had I chosen θ^*_{RA} and made a rational appeal. Moreover, given

$$\begin{aligned}\theta^*_{\text{RA}} N e^*(\theta^*_{\text{RA}}) - \delta(\theta^*_{\text{RA}}) &= \widehat{\theta}(\widehat{\chi})\Big(n_S e^*(\widehat{\theta}(\widehat{\chi})) + n_E e^*\big(\Omega(\widehat{\chi}, \widehat{\theta}(\widehat{\chi}))\big)\Big) - \delta\big(\widehat{\theta}(\widehat{\chi})\big) \\ &< \widehat{\theta}(\widehat{\chi})\Big(n_S e^*(\widehat{\theta}(\widehat{\chi})) + n_E e^*\big(\Omega(\chi, \widehat{\theta}(\widehat{\chi}))\big)\Big) - \delta\big(\widehat{\theta}(\widehat{\chi})\big)\,,\end{aligned}$$

you can see that I would be better off if I convince you I at least chose $\widehat{\theta}(\widehat{\chi})$. Moreover, if I will so convince you, it is indeed optimal for me to choose a $\theta \geq \widehat{\theta}(\widehat{\chi})$." In this light, the followers' beliefs are unreasonable and the equilibrium they support likewise unreasonable.

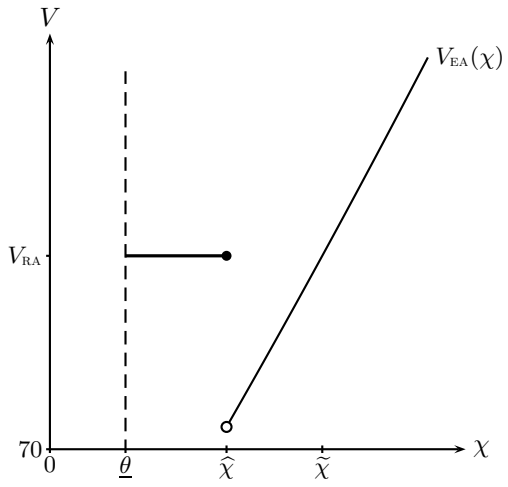


Figure 2: Organization's equilibrium payoff, V, as a function of the leader's charisma. Horizontal and vertical axes on different scales. Figure assumes $\underline{\theta} = 1$, $c(e) = e^2/2$, $n_S = n_E = 10$, $\mu = 3/4$, and $\delta(\theta) = 20(\theta - \underline{\theta})^3$.

Intuitively, the leader can substitute charisma for observable effort and *vice versa*: if she opts for an emotional appeal, she gets more effort from emotional responders than she would from a rational appeal; if, instead, she opts for a rational appeal, then her followers will see her choice of θ and *directly* respond to it. The leader, however, does not view this margin from the perspective of maximizing V because she bears 100% of the cost of her effort. Consequently, she will be more inclined to rely on charisma, which is free to her, than would be optimal. It further follows that a leader indifferent between the two kind of appeals must, therefore, generate a smaller value of the public good if she opts for an emotional appeal than were she to opt for the rational one. Proposition 13 and Figure 2 follow from this given the continuity of payoffs.

8 Charisma and Leading by Example

Hermalin (1998) showed a leader with *soft* information—that is, information she can misrepresent—can still credibly convey it by "leading by example": she chooses an action, e_L, first and publicly, which affects her followers' inferences about the state. In this section, I consider the interaction between charisma and leading by example. In particular, when does the leader behave according to the adage "actions speak louder than words" and when according to its converse?

The timing is similar to before: the leader learns θ at no cost to her; she either leads by example or makes an emotional appeal; based on what they see

or hear, the followers form beliefs about θ and choose their efforts in response.

If the leader makes an emotional appeal, her utility is just V. If she leads by example, her payoff is $V - c(e_L)$, where, on this path, $V = \left(e_L + \sum_{m=1}^{N} e_m\right)\theta$. Observe, when she leads by example, the leader is also a productive worker.

Leading by example is similar to making a rational appeal and the followers' utilities are correspondingly the same. In response to an emotional appeal, the followers utilities are also as given earlier.

Keeping models of leading by example tractable can be difficult (see Hermalin, 1998, for a detailed discussion of tractability in such models); hence, to ease pressure in this regard, assume, for this section, that $c(e) = e^2/2$.

The aim in what follows is to construct an equilibrium with the properties:

(i) there is a cutoff, $\theta_C \in (\underline{\theta}, \overline{\theta})$, a function of the leader's charisma, such that she makes an emotional appeal when $\theta < \theta_C$ and leads by example otherwise;

(ii) the leader's strategy when she leads by example, $e_L : [\theta_C, \overline{\theta}] \to \mathbb{R}_+$, is an increasing differentiable function (*i.e.,* more effort is a positive signal about the state); and

(iii) a follower's response to the leader's effort, $\widehat{e}(e_L)$, is an increasing function (*i.e.,* the leader's example is "followed").

Consistency of beliefs requires that followers' expectation of the state given an emotional appeal be $\Theta^{\mathbb{E}}(\theta_C)$. Consistency of beliefs also requires them to infer the state is θ when they observe $e_L(\theta)$. Rationality means they cannot believe the state exceeds $\overline{\theta}$ even if the leader's effort exceeds $e_L(\overline{\theta})$. The remaining belief to pin down is what do the followers believe if the leader leads by example, but supplies less effort than $e_L(\theta_C)$ (an out-of-equilibrium move)? Theory offers little guidance as to the answer and in what follows two possibilities will be considered:

Assumption 1. *If the leader leads by example, the followers believe the schedule $e_L(\cdot)$ is consistent with signaling in a version of the model in which emotional appeals are not feasible (i.e., the schedule is constructed as in Hermalin, 1998).*

Alternatively,

Assumption 1′. *If the leader leads by example, but $e_L \leq e_L(\theta_C)$, the followers believe the state is θ_C.*

A possible justification for Assumption 1 is the followers assign an arbitrarily small, but positive, probability that the leader, although possessing charisma, behaves like a professor (*i.e.,* is simply unwilling to ever make an emotional appeal). A possible justification for Assumption 1′ is that the followers believe that the leader never fails to make an emotional appeal if $\theta < \theta_C$; hence, no emotional appeal necessarily means that $\theta \geq \theta_C$.

A modeling advantage of Assumption 1 is that, if one also assumes that $\underline{\theta} = 0$, then a closed-form solution for $e_L(\cdot)$ can be obtained. In contrast,

if $\underline{\theta} > 0$ or Assumption 1′ holds, then no closed-form solution is possible.[25] Consequently, *when Assumption 1 is invoked, it is to be understood that* $\underline{\theta} = 0$.

If a separating equilibrium exists under leading by example, then the followers believe that $\theta = e_L^{-1}(e_L)$. Hence, $\widehat{e}(e_L) = e^*\big(e_L^{-1}(e_L)\big) = e_L^{-1}(e_L)$; where the last equality follows because $e^*(\zeta) = \zeta$ given $c(e) = e^2/2$.

A leader engaged in leading by example chooses e_L, when the state is θ, to solve

$$\max_{e_L} \theta\big(e_L + N e_L^{-1}(e_L)\big) - \frac{1}{2}e_L^2\,;$$

which has the first-order condition:

$$0 = \theta\left(1 + \frac{N}{e_L'\big(e_L^{-1}(e_L)\big)}\right) - e_L = \theta\left(1 + \frac{N}{e_L'(\theta)\big)}\right) - e_L(\theta)\,. \tag{27}$$

The leader's strategy, $e_L(\cdot)$, must satisfy the differential equation (27).

The solution to (27) depends on the initial conditions. Under Assumption 1, the initial condition is fixed by the well-known result that, in a separating equilibrium, the optimal play for the worst type (here, $\underline{\theta}$) is the same as it would be under *symmetric* information; hence, $e_L(\underline{\theta}) = e^*(\underline{\theta})$ under Assumption 1. Recalling the complementary assumption to Assumption 1—that $\underline{\theta} = 0$—the initial condition in this case is $e_L(0) = 0$. With that initial condition, it is readily seen that (27) has a linear solution: $e_L(\theta) = k\theta$, where, from (27), the constant k solves $1 + N/k = k$; hence,

$$k = \frac{1}{2}\left(1 + \sqrt{1 + 4N}\right) \tag{28}$$

(observe only the positive root is relevant).

Under Assumption 1′, the initial condition is given by the following:

Lemma 3. *Under Assumption 1′, if the state is the cutoff (i.e.,* $\theta = \theta_C$*) and the leader leads by example, then her effort equals the cutoff (i.e.,* $e_L(\theta_C) = \theta_C$*).*

Intuitively, under Assumption 1′, θ_C is analogous to the worst type in a standard signaling model and, as earlier noted, the worst type takes the same action that would be optimal were the game one of symmetric information (recall, given $c(e) = e^2/2$, $e^*(\theta) = \theta$).

When $\theta_C > 0$, as it will be generically, then the differential equation (27) has no closed-form solution given the initial condition $e_L(\theta_C) = \theta_C$ (*i.e.,* under Assumption 1′). Certain properties of the solution are, however, known:

Lemma 4. *Maintain Assumption 1′ and let* $e_L(\theta|\theta_C)$ *denote the solution to the differential equation* (27) *given initial condition* $e_L(\theta_C|\theta_C) = \theta_C$*. This solution satisfies the following properties:*

[25] An error in an earlier version of the paper led to the mistaken conclusion that a closed-form solution was possible in those settings. I thank Junjie Zhou for bringing the error to my attention and providing helpful suggestions for improving this section.

(i) $e_L(\cdot|\theta_C)$ *is increasing on* (θ_C, ∞)*;*

(ii) $e_L(\theta|\theta_C) > \theta$ *if* $\theta > \theta_C$*;*

(iii) $e_L(\theta|\theta_C) < \frac{1}{2}\left(1+\sqrt{1+4N}\right)\theta$ *(provided* $\theta_C > 0$*); and*

(iv) $e_L(\theta|\theta'_C) > e_L(\theta|\theta_C)$ *if* $\theta \geq \theta_C > \theta'_C$*.*

Next, we need to verify that the leader plays a cutoff strategy. To that end:

Lemma 5. *Under either Assumption 1 or 1′, if there exists an equilibrium in which the leader makes an emotional appeal when* $\theta < \theta_C$ *and leads by example otherwise, with* $\theta_C \in (\underline{\theta}, \overline{\theta})$*, then*

$$\theta_C\Big(e_L(\theta_C) + N\widehat{e}\big(e_L(\theta_C)\big)\Big) - c\big(e_L(\theta_C)\big) = \theta_C\left(n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big)\right). \quad (29)$$

For the desired equilibrium to exist, at least one θ_C must exist that solves (29) for each level of charisma within the relevant range. To speed the analysis, assume not only does it exist, but it is unique. Specifically, if the relevant assumption is Assumption 1, then assume:

Assumption 2. *For all relevant charisma levels,* $\chi \in (\underline{\chi}, \overline{\chi})$*, there is a corresponding* $\theta \in (\underline{\theta}, \overline{\theta})$ *that uniquely solves*

$$\left(\frac{2N+1}{2} - \frac{2N+1-\sqrt{1+4N}}{4}\right)\theta = n_S\Theta^{\mathbb{E}}(\theta) + n_E\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta)\big).$$

Given Assumption 1′, assume:

Assumption 2′. *For all relevant charisma levels,* $\chi \in (\underline{\chi}, \overline{\chi})$*, there is a corresponding* $\theta \in (\underline{\theta}, \overline{\theta})$ *that uniquely solves*

$$\frac{2N+1}{2}\theta = n_S\Theta^{\mathbb{E}}(\theta) + n_E\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta)\big).$$

As but one example, suppose θ is distributed uniformly on $[0,1]$. Assumption 2 then holds if

$$0 \leq \underline{\chi} < \overline{\chi} \leq \frac{1}{2} + \frac{1+\sqrt{1+4N}}{4\mu n_E}; \quad (30)$$

and Assumption 2′ if

$$0 \leq \underline{\chi} < \overline{\chi} \leq \frac{1}{2} + \frac{N+1}{2\mu n_E}.$$

Lemma 6. *Maintain Assumptions 1 and 2 or their prime versions. Let* θ_C *solve equation* (29)*. The leader's payoff is greater if she makes an emotional appeal if the state,* θ*, is less than* θ_C *than were she to lead by example. Conversely, it is greater if she leads by example if* $\theta > \theta_C$ *than were she to make an emotional appeal.*

The analysis to this point establishes:

Proposition 14. *Suppose the common disutility-of-effort function, $c(\cdot)$, is $c(e) = e^2/2$ and maintain Assumptions 1 and 2 or their prime versions. If Assumption 1 is made, suppose the worst possible state (i.e., $\underline{\theta}$) is 0. Then, holding fixed the leader's level of charisma, there exists a cutoff, θ_C, such that it is a perfect Bayesian equilibrium for the leader to make an emotional appeal if the productive state is less than θ_C and to lead by example if the state exceeds θ_C. Given Assumption 1, if she leads by example, her effort is $k\theta$, k given by* (28)*; given Assumption 1′, her effort, $e_L(\theta)$, is the solution to the differential equation* (27) *with initial condition $e_L(\theta_C) = \theta_C$.*

Turning to comparative statics, as before a more charismatic leader has a higher cutoff than a less charismatic one:

Lemma 7. *Given Assumptions 1 and 2 or their prime versions, the equilibrium cutoff, θ_C, defined in Proposition 14, is greater for a more charismatic leader than for a less charismatic one.*

Intuitively, an increase in charisma raises the value of an emotional appeal *ceteris paribus*. Given expression (29), the cutoff therefore needs to adjust (given that an increase in χ raises the righthand side of that expression). Because there is a unique cutoff (Assumption 2 or 2′), the followers' conditional expectation of the state moves "slowly enough" in the cutoff; hence, increasing the cutoff allows the lefthand side of (29) to "catch up" with the righthand side (even though that also raises the righthand side further, just not as fast).

The previous analysis, in particular Lemmas 4(iv) and 7, establish:

Proposition 15. *Suppose the common disutility-of-effort function, $c(\cdot)$, is $c(e) = e^2/2$ and maintain Assumptions 1 and 2 or their prime versions. If Assumption 1 is made, suppose the worst possible state (i.e., $\underline{\theta}$) is 0. Consider two charisma levels, $\chi > \chi'$, and corresponding cutoffs θ_C and θ'_C. For any productivity state, θ, the effort of the more charismatic leader (χ) does not exceed that of the less charismatic leader (χ'). Moreover, if $\theta \geq \theta'_C$, then the more charismatic leader expends strictly less effort if either Assumption 1′ holds or $\theta < \theta_C$ (or both).*

Proposition 15 is another illustration of the temptation charismatic leaders have to live by their charm; that is, like Propositions 9 and 13, a more charismatic leader is more inclined to substitute an emotional appeal for effort than is a less charismatic leader.

Proposition 15 can also have bearing on empirical analyses of charisma. Suppose, there is a secular shock, so that a number of similar organizations all enjoy high productivity and, thus, all leaders lead by example. If Assumption 1′ holds and, thus, Lemma 4(iv), then those organizations with less charismatic leaders will outperform those with more charismatic leaders. As such, the proposition highlights a potential pitfall in seeking to assess the value of charisma via cross-sectional analysis.

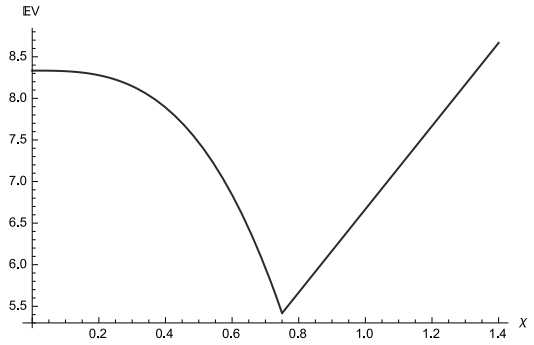


Figure 3: When the leader can lead by example, the expected value of the public good ($\mathbb{E}V$) in equilibrium can vary non-monotonically with the leader's charisma, χ. Figure plotted assuming the state, θ, is distributed uniformly on the unit interval, $\mu = 1$, and $n_E = n_S = 10$. Note only leaders with charisma to the left of the minimum (*i.e.*, $\chi \leq 3/4$) ever lead by example.

What is the effect of charisma on the *expected* value of the public good? The answer is ambiguous due the conflicting effects of greater charisma:

(i) when the leader makes an emotional appeal, a more charismatic leader directly induces greater effort than a less charismatic leader;

(ii) because a more charismatic leader is more likely to make an emotional appeal, followers are less pessimistic about the state upon receiving an emotional appeal from a more charismatic leader, so they supply more effort;

(iii) but a more charismatic leader supplies less effort than a less charismatic one; and

(iv) because the leader now incurs a cost to reveal information truthfully ($c(e_L) > 0$), her decision whether to do so is not solely determined by its effect on the public good; that is, her decision in this regard is suboptimal *vis-à-vis* maximizing V.

Figure 3 illustrates this potential ambiguity for a particular parameterization under Assumption 1.[26]

[26] Given Assumption 1 and assuming the state is distributed uniformly on the unit interval, it can be shown that $\mathbb{E}V$ is always decreasing in charisma for charisma in a range such that the leader leads by example in some states in equilibrium; that is, for χ not exceeding the rightmost term in (30). Details available from author upon request.

8.1 Another Perspective on Charisma & Leading by Example

In the just-completed analysis, charisma is a substitute for action. It is possible, though, to view them as complements if emotional responders identify with the leader.

Specifically, suppose the leader always chooses her effort before the followers. Sober responders' utility is as given earlier. The utility—or at least the objective function—of emotional responders is different: Such a responder, m, chooses his effort, e_m, to maximize

$$(1-\mu)V - \mu\frac{\chi}{2}(e_m - e_L)^2 - c(e_m)\,. \tag{3''}$$

The middle term captures the degree to which an emotional responder identifies with the leader: he suffers a loss if he "deviates" from the "norm," e_L, established by the leader. How much he suffers depends on the leader's charisma, χ; that is, how much he identifies with the leader.[27] As before, $\mu \in (0,1]$ reflects how "behavioral" he is. Note a sober responder is equivalent to an emotional responder for whom $\mu = 0$.

To speed the analysis assume $\underline{\theta} = 0$. Continue to assume $c(e) = e^2/2$. Let $e_L : [\underline{\theta}, \overline{\theta}] \to \mathbb{R}_+$ denote the leader's strategy. As before, limit attention to separating equilibria; hence, $e_L(\cdot)$ is invertible. Seeing e_L, a follower infers the state is $e_L^{-1}(e_L)$ and responds accordingly. Given $c(e) = e^2/2$, this means the efforts are

$$e_S^* = e_L^{-1}(e_L) \text{ and } e_E^* = \frac{(1-\mu)e_L^{-1}(e_L) + \mu\chi e_L}{1+\mu\chi} \tag{31}$$

for sober and emotional responders, respectively.

Given (31), the leader's utility can be written as

$$\theta\left(e_L + n_S e_L^{-1}(e_L) + n_E\frac{(1-\mu)e_L^{-1}(e_L) + \mu\chi e_L}{1+\mu\chi}\right) - \frac{e_L^2}{2}\,.$$

Limiting attention to differentiable strategies, the leader's choice of effort solves the first-order condition

$$\begin{aligned} 0 &= \theta\left(1 + n_E\frac{\mu\chi}{1+\mu\chi} + \left(n_S + n_E\frac{1-\mu}{1+\mu\chi}\right)\frac{1}{e_L'\left(e_L^{-1}(e_L)\right)}\right) - e_L \\ &= \theta\left(1 + n_E\frac{\mu\chi}{1+\mu\chi} + \left(n_S + n_E\frac{1-\mu}{1+\mu\chi}\right)\frac{1}{e_L'(\theta)}\right) - e_L(\theta)\,. \end{aligned} \tag{32}$$

Given $\underline{\theta} = 0$, it follows that $e_L(\underline{\theta}) = 0$. Hence, the solution to the differential equation (32) is a linear function: $e_L(\theta) = \xi\theta$, where ξ solves

$$1 + n_E\frac{\mu\chi}{1+\mu\chi} + \left(n_S + n_E\frac{1-\mu}{1+\mu\chi}\right)\frac{1}{\xi} = \xi\,. \tag{33}$$

[27] As noted in the Introduction, this utility function is similar to one used by Huck and Rey-Biel (2006). They, however, interpret $\mu\chi$ as a bias for conformity, rather than as identification times charisma. Were there no asymmetric information, the mathematics would be the same.

Because $e_L(\cdot)$ is increasing, only the positive root of (33) is relevant:

$$\xi = \frac{1}{2}\left(1 + n_E\frac{\mu\chi}{1+\mu\chi} + \sqrt{\left(1 + n_E\frac{\mu\chi}{1+\mu\chi}\right)^2 + 4\left(n_S + n_E\frac{1-\mu}{1+\mu\chi}\right)}\right).$$

Because the expression under the radical cannot be less than one, $\xi > 1$. For the same reason, $\partial\xi/\partial\chi > 0$: the leader's effort is increasing in her charisma.

Proposition 16. *When she leads by example, the leader expends more effort than either kind of follower does. Fixing the state, the leader's effort and that of an emotional responder are both increasing in the leader's charisma. Fixing the state, a sober responder's effort is unaffected by the leader's charisma.*

Proof: That the leader's effort is increasing in her charisma was already shown. From (31), a sober responder's effort is θ, given the equilibrium is separating; this level of effort is unaffected by the leader's charisma. Because $\xi > 1$, his effort is less than the leader's. From (31), an emotional responder's effort is

$$e_E^* = \frac{1}{1+\mu\chi}\theta + \frac{\mu\chi}{1+\mu\chi}\xi\theta - \frac{\mu}{1+\mu\chi}\theta\,.$$

Because the first two terms are a weighted average of θ and $\xi\theta$—and thus necessarily less than $\xi\theta$—and the last term negative, it follows that $e_E^* < e_L$. As χ increases, that weighted average puts more weight on the larger term, which itself is increasing; hence, the weighted average must increase. The term being subtracted decreases in χ. The sum of the effects is an increase in e_E^* as χ increases. ■

An immediate corollary to Proposition 16 is

Corollary 4. *Sober responders, those* not *directly influenced by charisma, strictly prefer a more charismatic leader to a less charismatic leader.*

Proof: A more charismatic leader supplies more effort herself and induces more effort from the emotional responders, both of which benefit sober responders. Because, conditional on the state, the sober responders' efforts do not vary with the leader's charisma, there is no cost to them of having a more charismatic leader. The result follows. ■

The preferences of the emotional responders are more complex. An increase in charisma offers them benefits: the leader supplies more effort as do their fellow emotional responders. But there is a cost: they themselves are induced to supply greater effort. Via examples, it can be shown that an increase in the leader's charisma can raise or lower their expected utility. As but one instance, suppose that θ is distributed uniformly on the unit interval, $\mu = 3/4$, and $n_E = n_S = 5$. Note $\underline{\chi} = 0$ and $\overline{\chi} = 11/6 \approx 1.83$. For $\chi < 1.61$ (approximately), the expected utility of an emotional responder is increasing in the leader's charisma; but, for $\chi > 1.61$, it is decreasing in her charisma.

9 Conclusions and Directions for Future Work

This paper offers insights into why an organization can—but need not always—benefit from having a charismatic leader, even if it consists largely (but not exclusively) of rational actors and even if those actors who are "irrational" are only slightly so (*i.e.,* have low μs). Further, the analysis shows why rational actors, those not inherently responsive to emotional appeals, will work harder in equilibrium in response to purely emotional appeals from more charismatic leaders than in response to similar appeals from less charismatic leaders. The paper also derives conditions under which such rational followers would prefer the organization be led by a more rather than less charismatic leader.

While an organization can benefit from having a more charismatic leader, greater charisma can prove detrimental if the leader must act (*e.g.,* learn information, boost productivity, or just expend effort): there is a danger she will substitute charm for action. These cautionary results help explain the mixed views of charisma in the empirical and management literatures. Mixed views could also be due to the fact that charisma is most valuable when the organization is likely to do badly, but it could be irrelevant (Section 3) or even harmful (Sections 6 and 8) when conditions are otherwise good.

Despite the many extensions already considered, work remains. For instance, in the models above, emotional responders (those directly susceptible to the leader's charm) work at least as hard as sober responders (those not directly susceptible) and, on certain paths, harder. This suggests that an organization's designers would want all followers to be emotional responders. Although some organizations seem to follow that prescription (*e.g.,* the US Military Academy, as described in Akerlof and Kranton, 2010), one suspects that many organizations would be wary about filling their ranks with people overly inclined to follow the leader. In particular, it could be beneficial to have people who will question the leader or provide alternative views. To the extent that charisma stifles alternative views, this could be another of its downsides. At the same time, the ability of a charismatic leader to get her followers to march in step enhances the value of knowing the direction to march, which in turn enhances followers' incentives to determine the best direction. How precisely charisma could be harmful or beneficial in such settings, where cohesion and diversity of opinions could both be valuable is an open question.

It is impossible for a leader to make an emotional connection with her followers without knowing what makes them tick.[28] Likewise experience suggests that one must be in the presence of someone or, at least, be able to see and hear her, for her charisma to work. Historically, this would suggest that charisma didn't scale well to large organizations. To an extent, Ibn Khaldûn made this point over 600 years ago: how, he asked, could relatively small and primitive tribes topple large and sophisticated empires? His answer was the former had stronger *asabîyah* (usually translated as social cohesion), which permitted them

[28] A fact long recognized; see, *e.g.,* the 14th-century *Muqaddimah* of Ibn Khaldûn (2004). For a more contemporary discussion, see Howell and Shamir (2005). Hermalin (2013) also discusses this point in the context of the connections between leadership and corporate culture.

to "box above their weight." Relative to this paper, his argument corresponds to one in which the relative isolation of emperors from their subjects foreclosed charismatic leadership in empires,[29] but the closeness of tribal leaders to their followers and *vice versa* allowed for charismatic leadership in tribes. Using the models above, it is easily shown that an organization led by a highly charismatic leader (or for which identification, μ, is large) can outproduce, in expectation, a larger organization led by an uncharismatic leader (or for which μ is low). Fleshing these ideas out fully, as well as tying them more to *asabîyah* and corporate culture, remain, though, topics for future research.

Charisma could scale better in the modern era, given polling and mass media. But such tools are expensive; so, organizations face tradeoffs. How much should an organization invest in building up the charismatic image of its leader? Would a desire to avoid those costs lead organizations to favor more naturally charismatic leaders or pursue strategies less dependent on having a charismatic leader?[30] A related point is that the image and charisma of past leaders often overshadow those of current leaders. To get out from the shadow, new leaders (or their organizations) may have to invest more in image management. Anticipating those costs, people could be reluctant to replace incumbent leaders. Moreover, by investing more, incumbents could raise their potential rivals' costs (or the cost of installing them). In short, incumbent leaders could have incentives to overinvest in image management to better entrench themselves, to the detriment of their organizations.[31] A full analysis of the pros and cons of such image management and manipulating the masses is, however, also a topic necessarily left to the future.

Finally, although the primary intent of this paper is to help make sense of existing evidence and studies concerning charismatic leadership, one could conceive of testing some of the paper's implications in a laboratory setting. Information-transmission models of leadership have enjoyed considerable success in laboratory settings (see, *e.g.,* Hermalin, 2013, §2.3.2.3, for a partial survey). Further there are many assessments in the social psychology literature, with good validity, for measuring both charisma and followers' receptivity to it (see, *e.g.,* Conger and Kanungo, 1994; Awamleh and Gardner, 1999; and Wong and Law, 2002). Using these assessments to distinguish sober from emotional

[29] Admittedly, an empire could have charismatic local officials and military commanders, but as they could also directly threaten the emperor (see discussion *infra*), an emperor could find that a costly solution. Certainly, history suggests there is considerable danger to those in power from charismatic military leaders.

[30] The social psychology literature suggests transformational change requires a charismatic leader (see, *e.g.,* Chatman and Kennedy, 2010, and Wang et al., 2011). If large organizations must invest more to make their leaders charismatic, then these arguments—speculative though they are—could explain why large organizations are harder to radically change than small ones.

[31] This may help to explain the significant resources dictators direct to building their personality cults. It also helps explain why they appear quick to eliminate other individuals who are charismatic: beyond the obvious advantage those individuals' charisma might yield should they seek to topple the dictator, their availability for a future government lowers the perceived costs of toppling the dictator.

responders, many of this paper's propositions would seem amenable to testing.

Appendix A: Proofs of Lemmas

Proof of Lemma 1: To prove part (i): fix θ and θ', $\theta \neq \theta'$. Let $\lambda \in (0,1)$ and define $\theta_\lambda = \lambda\theta + (1-\lambda)\theta'$. Because $e^*(\zeta)$ is the unique solution to

$$\max_e \zeta e - c(e) \tag{34}$$

and $e^*(\zeta) \neq e^*(\zeta')$ if $\zeta \neq \zeta'$, it follows that

$$\lambda\Big(\theta e^*(\theta) - c\big(e^*(\theta)\big)\Big) > \lambda\Big(\theta e^*(\theta_\lambda) - c\big(e^*(\theta_\lambda)\big)\Big) \text{ and}$$

$$(1-\lambda)\Big(\theta' e^*(\theta') - c\big(e^*(\theta')\big)\Big) > (1-\lambda)\Big(\theta' e^*(\theta_\lambda) - c\big(e^*(\theta_\lambda)\big)\Big).$$

Summing, those two expressions imply

$$\lambda\Big(\theta e^*(\theta) - c\big(e^*(\theta)\big)\Big) + (1-\lambda)\Big(\theta' e^*(\theta')\big) - c\big(e^*(\theta')\big)\Big) > \theta_\lambda e^*(\theta_\lambda) - c\big(e^*(\theta_\lambda)\big),$$

which establishes convexity.

To prove part (ii): the function $\theta \mapsto \theta e^*(\theta)$ is the sum of the functions $\theta e^*(\theta) - c\big(e^*(\theta)\big)$ and $c\big(e^*(\theta)\big)$. Part (i) established the first function is strictly convex, so part (ii) follows if the second is convex. From the first-order condition for (34), $\theta \equiv c'\big(e^*(\theta)\big)$. Hence,

$$1 \equiv c''\big(e^*(\theta)\big)e^{*\prime}(\theta) \Longrightarrow e^{*\prime}(\theta) \equiv \frac{1}{c''\big(e^*(\theta)\big)}. \tag{35}$$

It further follows that

$$e^{*\prime\prime}(\theta) = -\frac{c'''\big(e^*(\theta)\big)e^{*\prime}(\theta)}{c''\big(e^*(\theta)\big)^2} = -\frac{c'''\big(e^*(\theta)\big)}{c''\big(e^*(\theta)\big)^3}, \tag{36}$$

using (35). The second derivative of $c\big(e^*(\theta)\big)$ with respect to θ is

$$c''\big(e^*(\theta)\big)e^{*\prime}(\theta)^2 + c'\big(e^*(\theta)\big)e^{*\prime\prime}(\theta) = \frac{1}{c''\big(e^*(\theta)\big)} - \frac{c'\big(e^*(\theta)\big)c'''\big(e^*(\theta)\big)}{c''\big(e^*(\theta)\big)^3}, \tag{37}$$

where the equality follows from (35) and (36). The function $c\big(e^*(\cdot)\big)$ is convex if (37) is non-negative. To see it is non-negative, observe that $d\log\big(c'(e)\big)/de = c''(e)/c'(e)$ and the derivative of that, which is

$$\frac{c'''(e)c'(e) - c''(e)^2}{c'(e)^2}, \tag{38}$$

is non-positive by the assumption of log concavity. It is readily seen that (38) being non-positive implies (37) is non-negative. ■

Proof of Lemma 2: As a preliminary, recall that a leader pursuing an emotional-appeal strategy chooses θ to maximize (24). Hence, the marginal return, M_{EA}, to her choice of θ is a constant given the followers' beliefs; to wit,

$$M_{\text{EA}}(\chi) = n_S e^*\big(\widehat{\theta}(\chi)\big) + n_E e^*\Big(\Omega\big(\chi, \widehat{\theta}(\chi)\big)\Big)\,.$$

Her payoff is thus

$$V_{\text{EA}}(\chi) - \delta\big(\widehat{\theta}(\chi)\big) = \underline{\theta} M_{\text{EA}}(\chi) + \int_{\underline{\theta}}^{\widehat{\theta}(\chi)} \big(M_{\text{EA}}(\chi) - \delta'(\theta)\big) d\theta\,. \tag{39}$$

If she will pursue a rational-appeal strategy, her marginal return, M_{RA}, is

$$M_{\text{RA}}(\theta) = \frac{d}{d\theta} N\theta e^*(\theta) = N e^*(\theta) + N\theta e^{*\prime}(\theta)\,.$$

Lemma 1(ii) implies that $M_{\text{RA}}(\cdot)$ is an increasing function. Hence,

$$\begin{aligned} V_{\text{RA}} - \delta(\theta^*_{\text{RA}}) = \underline{\theta} N e^*(\underline{\theta}) + \int_{\underline{\theta}}^{\theta^*_{\text{RA}}} \big(M_{\text{RA}}(\theta) - \delta'(\theta)\big) d\theta \\ < \underline{\theta} N e^*(\underline{\theta}) + \int_{\underline{\theta}}^{\theta^*_{\text{RA}}} \big(M_{\text{RA}}(\theta^*_{\text{RA}}) - \delta'(\theta)\big) d\theta\,. \end{aligned} \tag{40}$$

Because necessarily $\widehat{\theta}(\widehat{\chi}) \geq \underline{\theta}$ and, as shown in the text, $\widehat{\chi} \geq \widehat{\theta}(\widehat{\chi})$ (because otherwise the leader does better to make a rational appeal), it must be that $M_{\text{EA}}(\widehat{\chi}) \geq N e^*(\underline{\theta})$. Note the first-order conditions imply $M_{\text{RA}}(\theta^*_{\text{RA}}) = \delta'(\theta^*_{\text{RA}})$ and $M_{\text{EA}}(\widehat{\chi}) = \delta'\big(\widehat{\theta}(\widehat{\chi})\big)$.

Suppose, contrary to the lemma's claim, that $\widehat{\theta}(\widehat{\chi}) \geq \theta^*_{\text{RA}}$. It follows from (39) and (40) that:

$$\begin{aligned} \Big(V_{\text{EA}}(\widehat{\chi}) - \delta\big(\widehat{\theta}(\widehat{\chi})\big)\Big) - \Big(V_{\text{RA}} - \delta(\theta^*_{\text{RA}})\Big) > \underline{\theta}\big(M_{\text{EA}}(\widehat{\chi}) - N e^*(\underline{\theta})\big) \\ + \int_{\underline{\theta}}^{\theta^*_{\text{RA}}} (\delta'(\widehat{\theta}(\widehat{\chi}) - \delta'(\theta^*_{\text{RA}}))d\theta + \int_{\theta^*_{\text{RA}}}^{\widehat{\theta}(\widehat{\chi})} (\delta'(\widehat{\theta}(\widehat{\chi}) - \delta'(\theta))d\theta \geq 0\,, \end{aligned} \tag{41}$$

where the last inequality follows because $\delta'(\cdot)$ is an increasing function. But (41) contradicts the indifference condition, $V_{\text{EA}}(\widehat{\chi}) - \delta\big(\widehat{\theta}(\widehat{\chi})\big) = V_{\text{RA}} - \delta(\theta^*_{\text{RA}})$. The result follows *reductio ad absurdum*. ■

Proof of Lemma 3: The unique solution to the program

$$\max_e \theta_C\big(e + N e^*(\theta_C)\big) - \underbrace{\frac{1}{2} e^2}_{c(e)}$$

is $e = \theta_C$. Hence, given Assumption 1′, were $e_L(\theta_C) > \theta_C$, a leader who led by example would wish to deviate, when $\theta = \theta_C$, from effort $e_L(\theta_C)$ to effort θ_C. Were $e_L(\theta_C) < \theta_C$, then, because $\widehat{e}(\cdot)$ is nondecreasing, the leader would wish to deviate to effort θ_C. ■

Proof of Lemma 4:[32]

Part (i): Because the equilibrium is separating, $e_L(\cdot)$ is invertible and, thus, strictly monotone on $(\theta_C, \overline{\theta})$. Define $\Gamma(e_L) = e_L + N\widehat{e}(e_L)$. By revealed preference, for $\theta > \theta' \geq \theta_C$:

$$\theta\Gamma\big(e_L(\theta)\big) - \frac{1}{2}e_L(\theta)^2 \geq \theta\Gamma\big(e_L(\theta')\big) - \frac{1}{2}e_L(\theta')^2$$

$$\text{and } \theta'\Gamma\big(e_L(\theta')\big) - \frac{1}{2}e_L(\theta')^2 \geq \theta'\Gamma\big(e_L(\theta)\big) - \frac{1}{2}e_L(\theta)^2 .$$

Hence

$$\theta'\Big(\Gamma\big(e_L(\theta)\big) - \Gamma\big(e_L(\theta')\big)\Big) \leq \frac{1}{2}e_L(\theta)^2 - \frac{1}{2}e_L(\theta')^2 \leq \theta\Big(\Gamma\big(e_L(\theta)\big) - \Gamma\big(e_L(\theta')\big)\Big). \quad (42)$$

Expression (42) implies

$$0 \leq (\theta - \theta')\Big(\Gamma\big(e_L(\theta)\big) - \Gamma\big(e_L(\theta')\big)\Big); \quad (43)$$

and, thus, $\Gamma\big(e_L(\theta)\big) - \Gamma\big(e_L(\theta')\big) \geq 0$. Consequently, (42) also implies

$$0 \leq \frac{1}{2}e_L(\theta)^2 - \frac{1}{2}e_L(\theta')^2 .$$

Because $e_L(\cdot)$ is strictly monotone, this means $e_L(\theta) > e_L(\theta')$.

Part (ii): It is useful to rewrite (27) as

$$e_L(\theta) = \theta\left(1 + \frac{N}{e_L'(\theta)}\right). \quad (44)$$

By part (i), $e_L'(\theta) > 0$.[33] Hence, unless $e_L'(\theta) = \infty$, the righthand side of (44) is greater than θ. Given that $e_L(\cdot)$ is differentiable, it is continuous. So, from (44), so too is $e_L'(\cdot)$, which rules out its being infinite on $(\theta_C, \overline{\theta})$. Hence $e_L(\theta) > \theta$ for all $\theta \in (\theta_C, \overline{\theta})$. (It is true, though, that $\lim_{\theta \downarrow \theta_C} e_L'(\theta) = \infty$.)

[32] Advice provided by Junjie Zhou was invaluable in writing this proof.

[33] To be precise, part (i) establishes $e_L'(\theta) \geq 0$. But as $e_L(\theta) = \infty$ can be ruled out as a solution, it follows from (44) that $e_L'(\theta) \neq 0$.

As will be seen, part (iii) is a corollary of part (iv); so, consider part (iv) first:

Part (iv): Unless $e_L(\cdot|\theta_C)$ and $e_L(\cdot|\theta'_C)$ coincide everywhere for $\theta \geq \theta_C$, they cannot intersect. To see this, suppose that $\theta_\dagger$ was a point of intersection (*i.e.,* $e_L(\theta|\theta_C) \neq e_L(\theta|\theta'_C)$ for θ immediately to the left of $\theta_\dagger$). It follows that the slopes of $e_L(\cdot|\theta_C)$ and $e_L(\cdot|\theta'_C)$ must, then, differ at $\theta_\dagger$; that is, $e'_L(\theta_\dagger|\theta_C) \neq e'_L(\theta_\dagger|\theta'_C)$. But then, from (44), it would be that $e_L(\theta_\dagger|\theta_C) \neq e_L(\theta_\dagger|\theta'_C)$, which contradicts $\theta_\dagger$ being a point of intersection. The claim follows *reductio ad absurdum*.

By Assumption 1′, $e_L(\theta_C|\theta_C) = \theta_C$. By part (ii), $e_L(\theta_C|\theta'_C) > \theta_C$. Given that the two curves don't intersect and the second lies above the first somewhere, the second must lie above the first across the entirety of their common domain; that is, $e_L(\theta|\theta'_C) > e_L(\theta|\theta_C)$ for all $\theta \geq \theta_C$.

Part (iii): Because $\theta_C > 0$ and

$$e_L(\theta|0) = \frac{1}{2}\left(1 + \sqrt{1+4N}\right)\theta$$

(see expression (28) and its derivation), the result follows immediately from part (iv).

■

Proof of Lemma 5: The lefthand side of (29) is the leader's payoff if she leads by example when $\theta = \theta_C$, the righthand side her payoff if she makes an emotional appeal. If the lefthand side were greater than the righthand side, then, by continuity, there would exist a $\theta < \theta_C$ such that

$$\theta\Big(e_L(\theta_C) + N\widehat{e}\big(e_L(\theta_C)\big)\Big) - c\big(e_L(\theta_C)\big) > \theta\left(n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big)\right).$$

But this would mean she would do better to lead by example for that θ than make an emotional appeal, in contradiction of the cutoff strategy she is supposed to play. If the righthand side of (29) were the greater, then, given $\widehat{e}(\cdot)$ and $e_L(\cdot)$ are continuous, there would exist a $\theta > \theta_C$ such that

$$\theta\Big(e_L(\theta) + N\widehat{e}\big(e_L(\theta)\big)\Big) - c\big(e_L(\theta)\big) < \theta\left(n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big)\right).$$

But this would mean she would do better to make an emotional appeal for that θ than lead by example, in contradiction of the cutoff strategy she is supposed to play. The result follows *reductio ad absurdum*. ■

Proof of Lemma 6: If the leader leads by example when $\theta \leq \theta_C$, her payoff is a strictly convex function. It is defined by

$$\theta \mapsto \left(k + n - \frac{1}{2}k^2\right)\theta\,, \tag{45}$$

k given by (28), under Assumption 1; and defined by

$$\theta \mapsto \theta^2 + N\theta\theta_C - \frac{1}{2}\theta^2 \tag{46}$$

under Assumption 1′. Given Assumption 2 or 2′, as relevant, that convex function intersects the line

$$\theta \mapsto \theta\Big(n_S\Theta^{\mathbb{E}}(\theta_C) + n_E\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big) \tag{47}$$

at $\theta = 0$ and $\theta = \theta_C$; hence, because the function (*i.e.,* (45) or (46)) is strictly convex, it must lie below the line (47) for $\theta \in (0, \theta_C)$. This means that the leader's payoff from making an emotional appeal given $\theta < \theta_C$ exceeds her payoff from deviating by leading by example.

If $\theta > \theta_C$, we have

$$\begin{aligned}\theta\Big(e_L(\theta) + N\widehat{e}\big(e_L(\theta)\big)\Big) - c\big(e_L(\theta)\big) &> \theta\Big(e_L(\theta_C) + N\widehat{e}\big(e_L(\theta_C)\big)\Big) - c\big(e_L(\theta_C)\big)\\ &> \theta\left(n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big)\right),\end{aligned}$$

where the first inequality follows because the leader prefers effort $e_L(\theta)$ to $e_L(\theta_C)$ if she is going to lead by example and the state is θ; and the second because (29) implies

$$e_L(\theta_C) + N\widehat{e}\big(e_L(\theta_C)\big) > n_S e^*\big(\Theta^{\mathbb{E}}(\theta_C)\big) + n_E e^*\Big(\Omega\big(\chi, \Theta^{\mathbb{E}}(\theta_C)\big)\Big)$$

given $c\big(e_L(\theta_C)\big) > 0$. Hence, the leader's payoff from leading by example given $\theta \geq \theta_C$ exceeds her payoff from deviating by making an emotional appeal. ■

Proof of Lemma 7: Because $c(e) = e^2/2$ and given Assumptions 1 or 1′, expression (29) has the form

$$\phi\theta_C^2 = \theta_C\Big(n_S\Theta^{\mathbb{E}}(\theta_C) + n_E\big((1-\mu)\Theta^{\mathbb{E}}(\theta_C) + \mu\chi\big)\Big)\,,$$

where

$$\phi = k + N - \frac{1}{2}k^2 = \frac{1}{4}\left(1 + 2N + \sqrt{1+4N}\right)$$

(note the use of (28)) under Assumption 1 and $\phi = N + 1/2$ under Assumption 1′. It follows, therefore, that (29) holds if and only if

$$\phi\theta_C = n_S\Theta^{\mathbb{E}}(\theta_C) + n_E\big((1-\mu)\Theta^{\mathbb{E}}(\theta_C) + \mu\chi\big)\,. \tag{48}$$

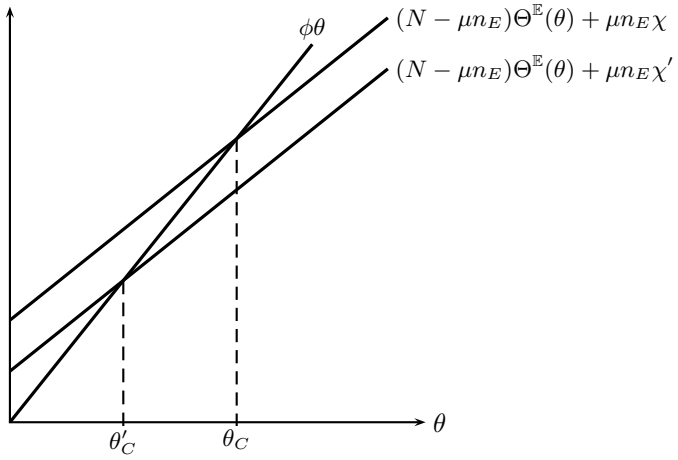


Figure 4: Illustration of the logic behind the proof of Lemma 7. Charisma χ is greater than χ', so the corresponding cutoffs, θ_C and θ'_C, are similarly ordered.

As a function of θ_C, the lefthand side of (48) is a positively sloped line passing through the origin. The righthand side is an increasing function with a positive intercept (*i.e.,* $n_E\mu\chi$). By Assumption 2 or 2′, as relevant, the line and function cross once; hence, the line crosses the function from below. Because an increase in χ shifts the function up, it follows that the intersection of the shifted-up function and the lefthand-side line must occur to the right of the old intersection; that is, the value of θ_C that satisfies (29) must be greater if χ is greater. Figure 4 illustrates the logic. ■

Appendix B: Mixed Messages in the Baseline Model

Contrary to the assumption of Section 2, suppose that the leader can send a "mixed message." She is, though, still subject to limited bandwidth; hence, the more she emphasizes the emotional, the less she can emphasize the rational and *vice versa*. To capture this idea, assume the leader chooses the "inτensity" of her emotional appeal, $\tau \in [0,1]$. What this means is that, with probability τ, a follower hears her exhortations, but does not hear or understand what θ is; with probability $1-\tau$, he hears what θ is, but is not influenced by the emotional aspects of her appeal. If the first event occurs, a follower understands that he has not heard or understood what θ is; instead, as before, he adopts a belief $\widehat{\theta}$ about θ. In this case, he supplies effort $e^*(\widehat{\theta}\,)$ if a sober responder and

$e^*\big(\Omega(\chi,\widehat{\theta}\,)\big)$ if an emotional responder. The expected value of the public good conditional on the true state being θ is, thus,

$$\theta \times \Big(N(1-\tau)e^*(\theta) + n_S\tau e^*(\widehat{\theta}\,) + n_E\tau e^*\big(\Omega(\chi,\widehat{\theta}\,)\big)\Big). \tag{49}$$

The leader maximizes (49) by choosing $\tau = 1$ if condition (6) holds and by choosing $\tau = 0$ otherwise. In other words, even if able to send a mixed message, the leader would never do so in equilibrium: she would make a purely emotional appeal if the state is low enough, otherwise a purely rational appeal. In short, assuming she cannot send a mixed message is without loss of generality, at least with this messaging "technology."

As a variant, suppose that followers understand the intensity of the leader's message. Suppose each E-type follower responds by maximizing

$$\big(\tau\chi + (1-\tau)\theta\big)e - \frac{1}{2}e^2 \tag{50}$$

and each S-type follower responds by maximizing

$$\big(\tau\widehat{\theta} + (1-\tau)\theta\big)e - \frac{1}{2}e^2 \tag{51}$$

(note, here, $c(e) = e^2/2$).[34] The story behind (50) is that E-type followers "buy-in" to the leader's message and charisma. The story behind (51) is that the S-type followers are skeptical and worry that the leader is trying to pull the wool over their eyes; hence, they increasingly discount the evidence about the true state the more emotionally intense is the leader's appeal. Note the S-type followers are now "quasi-behavioral" actors, although on the equilibrium path they will act fully rationally. Because $e^*(\zeta) = \zeta$ if $c(e) = e^2/2$, the expected value of the public good conditional on the true state being θ is, thus,

$$\theta \times \Big(n_S\big(\tau\widehat{\theta} + (1-\tau)\theta\big) + n_E\big(\tau\chi + (1-\tau)\theta\big)\Big). \tag{52}$$

If $\tau = 1$ doesn't maximize (52), then $\tau = 0$ does, and *vice versa*: the leader will *not* send a mixed message in equilibrium. The resulting analysis thus matches that in the text (with $\mu = 1$): for this variant, assuming no-mixed messages is also without loss of generality.

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[34] As will become clear, any $c(\cdot)$ such that the resulting $e^*(\cdot)$ is weakly convex will do.

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