

# Formal Models of Bureaucracy

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## Abstract

In the past decade, political science has witnessed a substantial amount of research using formal models to explicate the rationale for and effects of myriad aspects of bureaucratic institutions. Whereas previous waves of formal modeling on bureaucratic structure emphasized bureaucracy as a device for making policy commitments last, more recent formal research has grappled with information asymmetries and more explicitly considered the principal-agent relationship between bureaucracies and political authorities. We review several major recent themes in this literature, particularly the effects and development of bureaucratic hierarchies, the agency dilemmas inherent when policy-making authority is delegated to bureaucrats, and the effects of institutional structure on the development and sharing of expertise and capacity in bureaucracies.

## INTRODUCTION

The influence of administrative policy making on political and economic outcomes has grown broader and deeper during the past three decades. As a result, bureaucratic policy making has attracted considerable and growing attention from scholars. Formal models of the bureaucracy have played a significant role in the advance of this literature in political science, economics, and public administration. In this article, we summarize recent developments in the literature and establish some new results. Two previous reviews of the literature are by Bendor (1988) and Gill (1995).

Almost all of the recent formal literature on bureaucratic policy making in political science starts with some kind of information asymmetry and presumes some kind of principal–agent relationship between a bureaucratic agent and a principal who is either at a higher level in the bureaucracy or in some political position. The bureaucratic agent in these models typically possesses (or may come to possess) some information that the principal would like to extract to make a decision, e.g., determining a policy or allocating a resource. The principal has at its disposal some tools to determine the bureaucratic agent’s incentives to reveal or act on its information; e.g., the principal may choose the extent of the bureaucrat’s policy authority or review and possibly veto the bureaucrat’s decision. This approach matches up with some aspects of a Weberian perspective on bureaucracy.

Contemporary formal approaches to bureaucracy are distinguished from predecessors in the spirit of economics and public choice theory, e.g., Niskanen (1971) and related work, in several ways. Substantively, bureaucrats are usually, though not universally, assumed to maximize policy preferences of the same nature as most other political actors, such as legislators. This is in contrast to the assumption of budget maximization in earlier iterations of formal models of bureaucracy; in the contemporary strand of literature, budgets are usually at best implicit or, more likely, not considered at all, and bureaucrats’ preferences over budgets are derivable from ideological primitives rather than modeled directly. This turn toward ideological motivations follows a direction well-established in political science by the 1990s; e.g., it is considered unexceptionable in Epstein & O’Halloran (1994) and apparent in discussions of “bureaucratic drift” in the 1980s (e.g., McCubbins et al. 1987). In terms of modeling technology, this implies that formal models of bureaucratic politics usually employ the same spatial model of policy and policy preferences that predominates in formal studies of Congress.

Thus, recent formal literature on bureaucracy has shared with formal models of legislative politics both a basic spatial technology for formalizing ideological conflict and a keen interest in the informational implications of various structural arrangements in the bureaucracy. Despite these points of technological and thematic convergence, there are of course inherent differences between these fields. This is because bureaucratic policy making is distinguished from classical collective choice by several institutional features—such as hierarchical relationships, delegated authority, and specialized expertise—that are particularly amenable to formal modeling. Furthermore, each of these features raises important substantive questions. In what situations can political principals credibly delegate authority to subordinate agents? Under what circumstances would a principal be better off handing over such authority to someone else rather than making policy on his or her own? Should the principal always favor subordinates who share his or her preferences? How do the answers to these questions depend on the nature of the task at hand?

These inherent aspects of bureaucratic policy making—hierarchy, delegation, and specialized expertise—have all received sustained attention from formal theorists in the past decade. Thus, we organize our review around these three themes. It is not intended to be exhaustive. We have tried to keep compromises in coverage of the literature to a minimum while still maintaining some thematic coherence.

## HIERARCHIES

Hierarchy is a defining characteristic of bureaucratic agencies. The vertical relationship between one or more principals and one or more agents is arguably the centerpiece of a bureaucratic institution. Hierarchical decision making requires communication between agents within the hierarchy. Currently, three main approaches have been utilized in modeling this communication. In roughly increasing order of the presumed credibility of communication, these three approaches are cheap talk models, costly signal models, and verifiable signal models. We discuss each of these approaches in turn below.

### Cheap Talk Communication

It is difficult to overstate the importance of Crawford & Sobel (1982) to the formal study of communication within (and between) political institutions. Theirs has become the canonical model of strategic communication in unidimensional policy environments. They examine a game in which one actor, “the sender” (denoted by  $s$ ), attempts to influence an action chosen by a second actor, “the receiver” (denoted by  $r$ ), who ultimately chooses a policy. More specifically,  $s$  privately observes a state of the world (which is represented by a number and denoted by  $\omega \in \mathbf{R}$ ) and then sends to  $r$  a costless message, denoted by  $m \in \mathbf{R}$ . After observing  $m$  and updating his or her beliefs about  $\omega$  (a process that depends on the strategy used by  $s$ ),  $r$  then chooses a policy, which is also represented by a number and denoted by  $x \in \mathbf{R}$ .

A key presumption of this model (and all cheap talk models) is that the veracity of the sender’s message cannot be verified by the receiver before the receiver must make a policy decision. Accordingly, models of cheap talk are valuable in understanding communication in many settings because they demonstrate the conditions under which information might be reliably transmitted between two strategic individuals who do not have the luxury of third-party enforcement (i.e., the act of lying, per se, carries no penalty). Put in more formal terms, any communication that occurs between  $s$  and  $r$  in this setting must be supportable by (perfect Bayesian) equilibrium behavior by both agents: the message sent by  $s$  depends on  $s$ ’s private information and affects both the beliefs of, and action chosen by,  $r$ .

Crawford & Sobel’s (1982) key results can be summarized as follows:

1. Completely truthful communication is impossible unless the sender and receiver have identical interests.
2. If the two parties’ preferences over outcomes are sufficiently different, no information can be credibly transmitted, even in situations in which this failure is ex ante Pareto inefficient.
3. The maximal level of information that can be credibly conveyed between the two parties increases as their preferences over outcomes become more similar.

These results, and the framework within which they are derived, were almost immediately incorporated into the formal literature on political institutions (e.g., Gilligan & Krehbiel 1987).

**Extending the discussion: cheap talk within institutions.** Cheap talk models are central to institutional design insofar as they represent a setting in which communication is simply messaging—there is no commitment power inherent in simply claiming something. Accordingly, and particularly because the analysis of strategic behavior in cheap talk situations is quite complicated, the conclusions flowing from Crawford & Sobel’s model are both surprising and very useful. However, the application of these results in the literature to date has been mostly limited to settings in which the institutional design problem is constrained by the exogenously determined (policy) preferences of the sender and receiver.

This limitation is unnecessary, and in at least some ways undesirable from an empirical standpoint, when considering bureaucratic politics. A central concern in public administration is exactly whom shall be chosen as administrators—and who shall do the choosing. As Crawford & Sobel's results indicate, most models of policy making in uncertain policy environments provide conclusions that depend on the degree of preference divergence between the expert (i.e., the sender) and the decider (i.e., the receiver). This dependence, coupled with the empirical realities of bureaucratic politics, suggests that an appropriate next step in the formal study of bureaucracy involves theorizing about how best to allow both the preferences of, and information possessed by, bureaucrats to arise endogenously.

Of course, it is impossible (or at least very impractical) to “endogenize everything” in a formal model of policy making. Some exogenous limitations must be accepted in order to generate useful understandings of the incentives faced by the actors. The design of bureaucratic institutions is replete with both formal/theoretical and empirical/practical examples of such limitations. Examples of theoretical strictures are the nondelegation doctrine, various tenets of accountability and transparency, and the separation of legislative and executive authority. Examples of practical challenges include the fog of war, resource constraints, and collective action problems.

In the following section, we present a model of policy making in an uncertain policy environment within a separation-of-powers system. Both the separation of legislative and executive powers and the presence of policy uncertainty are key to our theory. The separation of powers is captured by allowing Congress and the President each to choose a delegate. The two delegates then play a cheap talk game prior to the President's agent choosing the final policy outcome. Specifically, Congress's agent is presumed to have policy-relevant information that can be conveyed to the President's agent only through cheap talk.

The focus of the model is an institutional design question: who should control the appointment of Congress's agent in this policy-making game? To provide some insight into this question, we explore several variants of the “delegated cheap talk” model. In all of these models, the President chooses the receiver in the cheap talk game, to reflect the constitutional requirement that executive power is vested in the President and separate from the legislative branch. The receiver processes information about the state of the world and consequences of policy alternatives, and about the sanctioned choice, and then implements a policy of its choosing.

**Delegated cheap talk and the design of hierarchies.** Although several scholars have assumed a hierarchical decision process and built it into a model, and we review these contributions below, a simple model of “cheap talk” communication provides some insight into why it is rational for Congress to create bureaucratic hierarchies in the first place. The separation-of-powers aspect of this decision makes the problem more subtle than the design of hierarchies in economic organizations, because the task in the political context is to explain why Congress grants the executive hierarchical control over its own informational resources. In other words, by constitutional arrangements the executive may have some authority to act in policy implementation, but this does not in itself imply executive control over subordinates to provide information in furtherance of the use of this authority. Yet in the United States, for instance, the elements of the bureaucracy directly under the President in a hierarchical sense—the cabinet departments and Executive Office of the President (i.e., excluding independent regulatory commissions)—exist in this arrangement because Congress has placed them there. Thus, Congress seems to be enabling an executive policy-making apparatus that in some cases can bypass Congress itself. Cheap talk models provide one interpretation of why such an arrangement makes sense from Congress's point of view.

We consider a modified sender–receiver game in which  $s$  and  $r$  represent different hierarchical levels in an administrative agency, which makes a policy choice in the face of uncertainty. The

set of available policies  $X$  for the agency is the set of real numbers  $\mathbb{R}$ , and a policy  $x$  is a single number  $x \in \mathbb{R}$ , as for example with a tax rate, subsidy, or block grant payment, or more abstractly, a “degree of intervention” in a regulated industry. As usual in sender–receiver models, results of the policy process are affected by both the policy choice  $x$  and random factors summarized in the “state of the world,” denoted  $\omega \in \mathbb{R}$ , such that  $z = x - \omega$  is the policy outcome. The object that actors care about is  $z$ , but the object that is actually chosen in the model is  $x$ .

The agency consists of two administrative agents,  $s$  and  $r$ —the “expert” and “authority,” respectively. The expert has full knowledge of the state  $\omega$ , whereas the authority knows only the probability distribution  $F(\omega)$  from which it is drawn.<sup>1</sup> The expert and authority need not have the same preferences over the outcome  $z$ . Such policy preferences of actors within the administrative agency are subject to influence by two constitutional actors (or “principals”)  $C$  and  $P$  (for Congress and President, respectively), as specified more fully below.

Policy making within the agency involves the expert ( $s$ ) sending a message or report ( $m \in \mathbb{R}$ ) to the authority ( $r$ ) regarding the state of the world ( $\omega$ ). The expert knows the state, but can make any report it wishes to the authority. After  $s$  sends the message  $m$  to  $r$ ,  $r$  chooses a policy  $x$ , the true state  $\omega$  is revealed, all four players ( $C$ ,  $P$ ,  $s$ , and  $r$ ) receive their payoffs, and the game concludes.<sup>2</sup>

**Separation of powers.** The influence of the constitutional actors in the administrative policy process consists of choosing the preferences of  $s$  and  $r$ , which in our framework are scalars denoted by  $v_s$  and  $v_r$ . We analyze three versions of this interaction, captured in three different game forms. The first of these represents a simple baseline that can be thought of as representing a situation in which the legislature has completely “abdicated” its policy-making responsibilities:  $C$  has no decisions to make, and  $P$  chooses both  $v_s$  and  $v_r$ . We refer to this as the unified game form, or **U**. In the second game form,  $P$  chooses  $v_r$  first and, after this choice is observed by  $C$ ,  $C$  chooses  $v_s$ . We refer to this as the President-goes-first game form, or **PF**, for “President first.” The third and final game form we analyze reverses the order of the second game form:  $C$  chooses  $v_s$  first and, after this choice is observed by  $P$ ,  $P$  chooses  $v_r$ . We refer to this final game form as the Congress-goes-first game form or **CF**, for “Congress first.”

Note that in all three game forms, the preference of the authority  $v_r$  is always chosen by the President. This is because  $P$  represents the executive branch of the government. Article II of the Constitution vests executive authority in the President, and efforts by Congress to eliminate the President’s constitutional role in execution would be questionable at best in light of this provision.<sup>3</sup> Although the relationship between  $P$  and  $C$  differs across the three game forms, the final choice of policy is always dictated by an agent who is ultimately responsible to  $P$ .

<sup>1</sup>See Carpenter (2001), Gailmard & Patty (2007), Stephenson (2006a), and Ting (2009) for justifications of the assumption of expertise and/or high capacity on the part of bureaucratic agents.

<sup>2</sup>Note, therefore, that we do not consider the allocation of administrative policy discretion in this model. Rather, we take as given a situation in which the policy choice will be made in an administrative process.

<sup>3</sup>There are two important exceptions to this from an empirical standpoint. The first is the “independent regulatory commission,” in which Congress delegates a quasi-legislative/quasi-judicial form of authority to an organ that is in many respects outside of the executive branch. The second occurs when Congress codifies a right or entitlement due to a party on one side of a (private or public) relationship, e.g., as in defining a tort, and leaves it to that party to seek redress in court for violations of that right by other parties. In both of these cases, however, separation of powers still requires an actor other than Congress (e.g., the commission, the plaintiff, and/or the court) to “execute” the policy. Accordingly, although our model does not offer an explanation of why such alternative mechanisms are employed by Congress, the incentives identified here would translate into those arrangements as well.

In each of the games, the payoff functions of the four players ( $C$ ,  $P$ ,  $s$ , and  $r$ ) are given by

$$\begin{aligned} u_C &= -(x - \omega - \pi_C)^2 \\ u_P &= -(x - \omega - \pi_P)^2 \\ u_s &= -(x - \omega - v_s)^2 \\ u_r &= -(x - \omega - v_r)^2. \end{aligned}$$

The parameters  $\pi_C$  and  $\pi_P$  are exogenous, common-knowledge ideal points of  $C$  and  $P$ , respectively. We refer to  $\pi_P - \pi_C$  as the “preference divergence” between  $P$  and  $C$  and assume, without loss of generality, that  $\pi_C \leq \pi_P$ . As described above, the institutional actors  $C$  and  $P$  are responsible for choosing the ideal points of the expert and the authority,  $v_s$  and  $v_r$ . We refer to  $v_r - v_s$  as the “dissonance” between  $r$  and  $s$ . The preferences of the expert and the authority are perfectly aligned when the dissonance equals zero. Furthermore, we assume that  $v_s$  and  $v_r$  each may be any real number: there are no exogenous constraints on the institutional actors’ choice of agents. The state of the world is assumed to be drawn according to the uniform distribution on  $[0,1]$ . After  $v_s$  and  $v_r$  are chosen, they are assumed to be revealed and become common knowledge. After this,  $s$  and  $r$  play the Crawford-Sobel cheap talk game with ideal points  $v_s$  and  $v_r$ . There are multiple equilibria to these games, not necessarily all payoff equivalent. As is typical in the literature, we assume that for any choice of ideal points  $(v_s, v_r)$ , the most informative equilibrium is played by  $s$  and  $r$ : in the setting examined here, this equilibrium maximizes the ex ante expected payoffs of both players.

**Which game form?** Because we do not specify one game form to capture the institutional structure in our setting, we comment briefly on the rationale for the different game forms we use. The main reason for analyzing several different game forms is that there is more than one way to interpret the allocation and sequence of decision rights, but the ones we analyze all yield qualitative results that support our argument about separation of powers and the incentives of Congress.

Our focus is on Congress’s incentives to decouple expert preferences from Congress and link them to the executive, which suggests a game form in which Congress influences the policy preferences of the expert, as in the **CF** and **PF** games. Separation of powers and the Article II grant of executive authority to the President suggest a game form in which the President influences the policy preferences of the executive authority, as in all three game forms. Beyond these considerations, both the **CF** and **PF** games are empirically defensible. On the one hand, the preferences and incentives of career bureaucrats are in part determined by details of agency structure and process (McCubbins et al. 1987, 1989) that are set by Congress and durable across many changes in presidential administrations. This points to the **CF** game, in that Congress chooses agency structure, and by implication policy preferences, to which the President must respond. On the other hand, Congress also retains the power to change agency structure as it wishes, and its ex post oversight authority also affects the induced preferences of bureaucratic agents. Therefore, for a given choice of senior agents by the President, Congress retains some authority to respond. This points to the **PF** game, in that the President chooses his agents and Congress can respond if it wishes. Absent a decisive reason for preferring one game to the other, we analyze them both.

Although we explore the **U** game form as well, it is arguably inconsistent with the delegation doctrine, as it entirely removes Congress from policy formulation.<sup>4</sup> It is as close as our model can

<sup>4</sup>The wholesale control of policy by the President in the **U** form seems reminiscent of the provisions of the National Industrial Recovery Act of 1933 that granted the President and his agents unchecked authority to develop “codes of fair competition” for specific industries, and that roused the Supreme Court to invoke the delegation doctrine and eviscerate the statute in the *Schechter Poultry* case.

get to a total abdication of policy-making responsibility by Congress, as there are no congressionally specified limits on executive authority and no participation, even indirect, by Congress in policy choice. Nevertheless, as we clarify below, the **U** game is interesting because of its relationship to the other games in which Congress is active and superficially seems able to sway policy in its direction.

**Analysis.** We begin our analysis of the model with the preferences of each of the constitutional actors over the three game forms. Although the game forms are not themselves objects of choice by the constitutional actors in our model, these preferences reveal insights about the important channels of control of the policy process, as opposed to the formal allocation of decision or participation rights. They are specified in the theorems below.<sup>5</sup>

**Theorem 1:** *In terms of ex ante expected equilibrium payoffs, P (1) is indifferent between the **U** and the **PF** game forms and (2) strictly prefers either of those to the **CF** game form.*

Theorem 1 implies that the executive weakly prefers appointing both the expert and the authority, and weakly prefers making his choice before Congress makes its decision. The result states that *P* is indifferent about the role of *C* as long as *P* can commit to a choice of  $v_r$  before *C* chooses  $v_s$ . Put differently, *C* has some formal role in the **CF** game and not in **U**, but the difference is superficial because in equilibrium these two games are equivalent; *P* gets exactly its desired agents as both sender and receiver.

**Theorem 2:** *In terms of ex ante expected equilibrium payoffs, C (1) strictly prefers the **CF** game form to either the **U** or the **PF** game forms and (2) is indifferent between **U** and **PF**.*

Theorem 2 has significant implications for the incentives of Congress regarding intervention in the informational activities within the administrative branch. Interestingly, **U** and **PF** are exactly the same from Congress's point of view, even though Congress has no role whatsoever in **U** and controls the expert completely in **PF**. From a formal authority standpoint, these are very different games, but in expected-utility terms the difference is superficial. In both game forms, the President determines  $v_r$  while or before  $v_s$  is chosen. Given a choice of  $v_r$ , Congress wants full communication within the administrative hierarchy.

A key characteristic of equilibria of sender-receiver games is that the receiver can always do at least as well in the game by simply ignoring the sender's message and setting policy based solely on his or her prior beliefs about  $\omega$  (i.e., according to *F*). In the traditional Crawford-Sobel cheap talk setting, this implies that the receiver can do no worse than choosing policy to equal the expected value of  $\omega$ . This feature has significant implications for the model examined here. In particular, regardless of which game form is considered, *C*'s impact on the expected policy outcome is rather limited. In the Crawford-Sobel setting, policy set in any perfect Bayesian equilibrium (PBE) equals the expected value of  $\omega$  plus  $v_r$ .<sup>6</sup> This is true regardless of the sender's payoff function  $v_s$ .

We can get a better sense of the incentives and similarities among the game forms, and the qualitative results common across them, by exploring the choices by the constitutional principals in the most informative equilibrium of each game. We turn next to analysis of these equilibrium choices.

<sup>5</sup>Proofs for both theorems, and all numbered results, are contained in the appendix to Gailmard & Patty (2012).

<sup>6</sup>See Crawford & Sobel (1982), p. 1441. Note that Crawford & Sobel do not, strictly speaking, use perfect Bayesian equilibrium as their solution concept. Nonetheless, their analysis is consistent with the additional refinements imposed by PBE.

**Unified control.** The **U** game form is trivial:  $P$  chooses a sender and a receiver whose preferences are identical (i.e., there is no dissonance). Furthermore, their preferences are identical to  $P$ 's.

**Proposition 1:** *In any perfect Bayesian equilibrium of **U**, the sender and receiver each share  $P$ 's preferences. Formally,  $v_s^* = v_r^* = \pi_P$ .*

**President goes first.** Analysis of the **PF** game form is only slightly more complicated than that of the **U** game form. The key recognition is that, in all equilibria of the Crawford-Sobel cheap talk model (i.e., not just those in the leading case with quadratic preferences and a uniform distribution over the state), the ex ante and interim (i.e., conditional on the message  $m$  sent by  $s$ ) expected value of the policy  $x$  is equal to the (ex ante or interim, as appropriate) expected value of  $\omega$  plus  $v_r$ . Thus, the only effect that  $C$  can have on the equilibrium distribution of policy outcomes is to increase its variance. Substantively,  $C$  cannot affect the ideological bent of administrative policy through its choice of  $v_s$  in any way beneficial for itself after  $P$  has chosen  $v_r$ . Accordingly, it is weakly dominant, conditional on the choice of any given  $v_r = \bar{v}_r$ , for  $C$  to choose  $v_s = \bar{v}_r$ . Given this fact, it follows that  $P$  should choose  $v_r = \pi_P$ , secure in the knowledge that  $C$  will subsequently defer to this choice when selecting  $v_s$ .

**Proposition 2:** *In any perfect Bayesian equilibrium of **PF**,  $C$  and  $P$  each appoint agents sharing  $P$ 's preferences. Formally,  $v_s^*(v_r) = v_r$  and  $v_r^* = \pi_P$ .*

Thus  $P$  chooses a perfect agent as the implementing authority, and  $C$  chooses the expert to match it perfectly. Although Congress would rather not face an implementing authority  $v_r$  distinct from itself, it has no choice in the matter. It would rather have the executive authority act on good information than strategically garbled, partial information, and it effects this by matching the preferences of the expert and the authority. In short, in the **PF** game form, the influence of  $P$  over the decisive implementing agent within the administrative policy process gives  $C$  a clear incentive to link the preferences of the informational agent,  $s$ , to those of  $P$ .

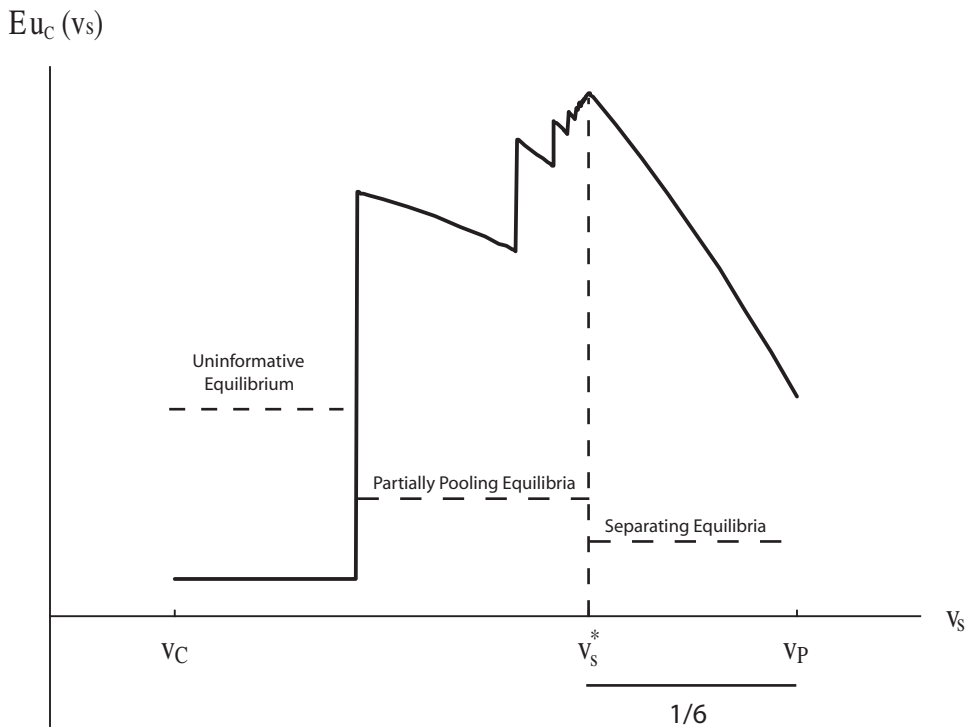
**Congress goes first.** Whereas the **PF** game gives a decisive first-mover advantage to  $P$ , the corresponding advantage does not exist for  $C$  in the **CF** game. In this game form,  $C$  has mixed incentives. In particular,  $C$  can pull the expected policy outcomes toward its ideal point by some finite amount. Furthermore, this amount is exogenous, implying that  $C$  will get its ideal point  $\pi_C$  as the policy outcome in the **CF** game so long as the preference divergence  $\pi_P - \pi_C$  is not too large. Specifically, this occurs if and only if  $\pi_P - \pi_C \leq \frac{1}{6}$ . When the preference divergence is greater than this amount, the unique equilibrium is characterized by  $v_s^* = \pi_P - \frac{1}{6}$ . We bypass the calculations (which extend results in Dessein 2002)<sup>7</sup> and simply state the equilibrium.

**Proposition 3:** *In any perfect Bayesian equilibrium of **CF**, the agents appointed by  $C$  and  $P$  have identical preferences, and those preferences are equal to  $C$ 's so long as the dissonance between  $C$ 's and  $P$ 's preferences is not too great. Otherwise, the agents share preferences that have a fixed and constant dissonance with the preferences of  $P$ . Formally,*

$$v_s^*(v_r) = v_r \text{ and } v_r^* = v, \quad \text{where } v = \begin{cases} \pi_C & \text{if } \pi_P - \pi_C \leq \frac{1}{6}, \\ \pi_P - \frac{1}{6} & \text{if } \pi_P - \pi_C > \frac{1}{6}. \end{cases}$$

<sup>7</sup>This game form is equivalent to allowing  $C$  to set the agent's bias in the model examined in Section 6 of Dessein (2002).





**Figure 1**

*C*'s equilibrium expected utility in the CF game,  $\pi_C = 0$ ,  $\pi_P = 0.5$ . *C*'s equilibrium choice,  $v_s^*$ , is marked by the vertical dotted line. Also marked is the type of signaling game that would be played by *s* and *r* following each possible choice of  $v_s$ .

Even in the **CF** game form, where *C*'s strategic position is at its strongest, *C* has an incentive to “anchor” the preferences of its chosen informational agent,  $v_s$ , to those of *P*,  $\pi_P$ , whenever *P* and *C* are not too closely aligned in ideological terms. Paradoxically, then, it is only when Congress and the President have similar enough policy goals that Congress desires an agent that is its ideological clone. When *C* and *P* are not especially close ideologically, the preferences of *C*'s ideal expert are not the same as *C*'s own preferences and are completely determined by *P*'s preferences. *C*'s ideal agent essentially “chases” *P* as  $\pi_P - \pi_C$  grows, to maintain informative communication within the administrative hierarchy. Separation of powers, specifically control over the implementing authority *r*, means that *P* always holds some cards in interactions with *C* in the policy process.

An example of *C*'s equilibrium payoff function in an instance of the **CF** game (namely, with  $\pi_C = 0$  and  $\pi_P = 0.5$ ) is displayed in **Figure 1**. *C*'s equilibrium choice,  $v_s^*$ , is marked by the vertical dotted line. Also marked in the figure is the type of signaling game that would be played by *s* and *r* following each possible choice of  $v_s$  (i.e., for each  $v'_s \in [0, 0.5]$ , the figure describes the type of signaling behavior that would be played in the most informative equilibrium of the  $v'_s, v'_r(v'_s)$  Crawford-Sobel cheap talk game). As *C* concedes more to *P*'s policy preferences, *P* becomes more willing to delegate to an authority with preferences closer to *C*'s—capturing (along branches of the game tree that are never observed in equilibrium) a type of “give and take” between the two institutional actors. Eventually, if *C* concedes enough to *P*, *P* is essentially willing to delegate complete authority to the expert in the sense of choosing  $v_r = v_s$ . The figure illustrates that the

closest point at which this occurs maximizes  $C$ 's expected payoff. This is the case even though  $C$  can obtain (somewhat) informed policy making with less extreme choices of  $v_s$ . To understand why this is the case, simply consider the analysis of the **PF** game form and the following fact: for  $v_s < \pi_P - \frac{1}{6}$ ,  $v_r^*(v_s) > \pi_P - \frac{1}{6}$ .  $C$ 's choice of  $v_s$  affects the expected policy outcome solely through its effect on  $v_r$ ; thus, moving  $v_s$  to a location further from  $\pi_C$  results in both expected policy outcomes that are closer to  $\pi_C$  and less variance in the policy outcomes.

The principal finding is that, regardless of how the executive and legislature interact, there is an unambiguous incentive for the legislature to defer to the executive in the appointment of the advisors. To the degree that the legislature is forced to appoint the informational agents, its optimal choice always coincides with the executive's agent's ideal point. The lesson for the design of hierarchies is that implementing this arrangement is easily accomplished in a hierarchical organization where the top of the hierarchy has complete control to pick its ideal agents both as bottom-level advisors and as mid-level decision makers who act on that information. In this type of hierarchy, the bottom level is completely transparent and forthcoming in its communications with the mid-level actors, who take decisions exactly in accord with the top.

In this way, this simple model identifies the incentives of Congress to design executive hierarchies and place them under the immediate control of the President. The model only "works" when the President has some authority in the first place, and this may come from statute, claim to unilateral power, or otherwise; the source of this authority is less important than its existence. If the executive does not have authority to act, the model does not imply that Congress should place hierarchies under presidential control; it may be better off parceling out authority to actors other than the President, and presumably giving those other actors access to their own information to use in pursuit of policy implementation.

**Conclusion.** This "delegated cheap talk" model of bureaucratic policy making was originally motivated by the recognition of the possibility that the rise in the power of the presidency in the twentieth century resulted at least in part from the rise of the president's access to high-quality information. The model, built from mostly "off-the-shelf" parts, demonstrates that in some cases Congress has an incentive to support the President's informational capacity and therefore to contribute to the rise of presidential power. Furthermore, the model highlights that this incentive flows from the separation of powers when policy execution authority is lodged in the executive, and policy choices have uncertain results. This institutional arrangement gives Congress an incentive to pin experts' policy preferences to those of the President, to facilitate policy-relevant communication with executive branch authorities that shape policy implementation and that the President is constitutionally entitled to select. Previous formal studies of legislative design of administrative structures found that information begets discretion (Epstein & O'Halloran 1999), but this model shows the converse is true as well: discretion begets information. Viewing Congress as choosing an agent who provides policy expertise, this model implies a failure of the "ally principle": Congress's ideal agent is not its ideological clone. It is nevertheless optimal in cases where a clone would not be able to provide reliable information that actually gets used in policy making.

These incentives to link agent preferences to those of the President have implications for the structure of bureaucratic organizations in the United States. In areas where the President has a measure of discretion that Congress either cannot (by constitutional stricture) or chooses not to abrogate, Congress supports the President's informational capacity by creating relatively unified administrative structures under the President's immediate control. This is particularly relevant for foreign affairs and national defense, and also for the President's role in coordinating the national budget. However, in areas where Congress has more freedom to allocate and control administrative discretion in its own interests, it has an incentive to do so, and not to create unified

administrative structures that help to bolster the President's informational capacity. In a sense, this model bears on debates about the "unitary executive." A unified executive is not necessarily undesirable for Congress and, in those cases in which the degree of executive unity is an object of congressional choice and not simply provided for by the Constitution (e.g., the siting of regulatory, advisory, and adjudicatory organs of the federal government), this model provides another way to view congressional decisions about unified institutional control of the executive branch.

### **Costly Signaling and Communication**

Cheap talk models of policy making have arguably represented the heart of the formal literature on delegation and bureaucratic policy making over the past 20 years. However, the possibility of "costly signaling" has received attention, too. The seminal instantiation of this type of model was offered by Spence (1973), who considered whether and how job applicants might convey (or, perhaps, obfuscate) their individual quality level as a potential employee to potential employers. Spence's fundamental insight was that a costly signal of quality (e.g., additional education) need not, in equilibrium, represent any fundamental change to the latent value of potential matches between employees and employers. Instead, a costly signal might be invested in by an employee because the cost of that signal is known to be lower for potential employees of higher quality.

Gordon & Hafer (2005) apply this insight in constructing a model in which a regulated firm can choose both how closely to comply with (costly) regulatory requirements and how much money to "contribute" as an observable signal of its type. Gordon & Hafer then apply their model's conclusions to enforcement actions by the Nuclear Regulatory Commission. In situations in which informative signaling is possible in equilibrium, a firm's contribution conveys information about the firm's (privately observed) costliness of compliance. To the degree that increased costliness of compliance implies that the firm will be more willing to burn agency resources by, for example, challenging enforcement actions, the firm can credibly signal its compliance costs to the agency.

Similarly, Bueno de Mesquita & Stephenson (2007) apply the notion of costly signaling in hierarchical policy-making environments to the interactions between regulatory politics and judicial review. Their focus is on the observability of effort and the effect of ex post review on the allocation of effort between tasks for which the effort can be observed and those that are unobserved by the reviewer(s) of the ultimately proposed policy. The key finding is that, although ex post review can improve welfare for the obvious reasons, there also exist situations in which the agency's motivation to survive review may lead to a misallocation of effort by the agency—i.e., an overemphasis on those tasks for which the effort is observable to the detriment of those tasks that might improve the quality of the policy but will not generate sufficient deference by the reviewer. If this misallocation is pronounced, then delegating policy-making authority in the shadow of ex post review is weakly dominated by either eliminating ex post review or not delegating policy-making authority at all.

### **Communication with Verifiable Information**

Cheap talk and costly signaling represent, in a sense, a connected interval containing approximately two-thirds of the "credibility continuum" of signaling models. The final third of this continuum consists of situations in which the information held by one agent can be verifiably and credibly revealed to another agent. The canonical formal model examining the degree to which information is conveyed in such environments is offered by Milgrom & Roberts (1986), who consider competition between third parties seeking to influence a decision maker's policy choice through the revelation of credible policy-relevant information. The primary innovation of their work is the introduction of what they term persuasion games. In a persuasion game, any information revealed

by any agent can be costlessly verified, but no agent need reveal information. This type of signaling game has resided at the center of several recent models of bureaucratic policy making.

Boehmke et al. (2006) examine a model of the creation of alternative policy-making venues. That is, they consider the possibility of the principal delegating authority to an agent who may then be approached by a third party (e.g., a regulated firm) possessing a verifiable signal about the state of the world.<sup>8</sup> They show that the principal will frequently prefer to hand such authority to an agent whose preferences differ from his or her own. In particular, the principal can utilize this institutional arrangement as a means to alleviate the third party's worries about a potential "hold-up problem." Such problems can occur when the third party holds information that offers the opportunity for a Pareto-improving policy change, but the third party would prefer to withhold the information if the principal used it to select the principal's (state-conditioned) most-preferred policy. By appointing an agent—with unilateral discretionary authority—whose most-preferred policy in such a case is within the Pareto set for the third party and the principal, the principal can successfully elicit information from the third party and increase all players' welfares.

Moving in a direction complementary to that explored by Boehmke et al. (2006), Carpenter & Ting (2007) develop a model of the endogenous creation of information by a regulated firm. Carpenter & Ting examine a situation in which a (privately informed) firm must invest in the costly procurement of information about the quality of a product prior to possibly submitting the product for approval by the regulator.<sup>9</sup> A central choice variable in their model is how much information to procure: the firm knows the type of the product (which determines the firm's expected gross profit from its approval) but does not know whether further investigation will yield "successful" experiments. In their framework, the outcome of experiments is publicly observable. The interesting aspect of the agency's strategy is how it treats submissions with different amounts of experimentation.

Whereas Boehmke et al. (2006) and Carpenter & Ting (2007) consider how information is provided to government agencies by the private sector, Ting (2008) examines how information about the actions of government agencies reaches the electorate, how institutions affect this flow of information, and how the possibility of "whistleblowing" may affect hierarchical relations within the agency. Ting's model considers a political principal who is uninformed about the quality of a project being carried out by an agency consisting of a manager and an employee. The manager's preferences about the types of project worth carrying out may differ from the principal's. The employee is charged with actually exerting effort to carry out the project. The quality of the project is a function of the employee's effort, which is itself unobservable to both the manager and the political principal. After the employee's effort level is chosen, the quality of the project is then observed by the manager and the employee. The central feature of Ting's model is that the principal benefits from the employee being allowed to alert the principal when the quality of the project is low, with the principal then having the opportunity to replace the manager. The central conclusion is that the interaction of the ability to inform when the project is of low quality with the fact that the employee dislikes exerting effort can in some circumstances allow the employee—who is also interested in the quality of the project—to essentially insure himself or herself against

<sup>8</sup>The model and analysis of Boehmke et al. (2006) are simultaneously related to delegation and bureaucratic expertise to the degree that the appointee is presumed to be capable of verifying the third party's signal at no cost, whereas the principal must exert (costly) effort to achieve the same level of clarity if the third party chooses to approach him or her in pursuit of policy change.

<sup>9</sup>Their application—to which the model is ably and appropriately tailored—involves pharmaceutical firms investigating/developing drugs for possible submission for approval by the US Food and Drug Administration, but much of their model would apply more generally.

low effort levels. In expectation, this reduces the principal's welfare below the level that he or she would enjoy if the employee knew *ex ante* that his or her effort level was more instrumental to his or her payoff due to the fact that the project would go forward regardless of its quality.

Patty (2009) examines a model of policy making with endogenous information collection within a multitask environment. A political principal is assumed to have authority to choose one of two mutually exclusive tasks to perform after an agent has collected hard (*i.e.*, verifiable) information about the relative values of the two tasks. The principal and agent have different preferences about which task they would perform in the absence of information, and the agent must decide how much information to collect about the value of each of the two tasks. When the principal's preferences are sufficiently different from those of the agent, the agent's optimal behavior is to collect information only about the task favored by the principal. This "top-down bias" results from the fact that the agent should collect information about a task in rough proportion to the likelihood that the task will be performed.

Gailmard & Patty (2011) develop a model of parallel information transmission within bureaucratic agencies. They consider a situation in which one agent chooses whether to forward policy-relevant, verifiable information ("reports") to a principal who then may use the information to make a binary policy decision. Gailmard & Patty consider the effect of inserting a second agent (a "stovepipe") who may also be able to forward the report to the principal. When the principal's policy preferences are more aggressive than the agent's (*i.e.*, when there are reports that the principal would act on but the agent would prefer that the principal did not), the principal will have an incentive to insert a stovepipe in an attempt to circumvent the agent's attempts to stymie the principal's policy-making efforts. Although the principal necessarily prefers to insert a stovepipe when the reports are generated in an exogenous fashion, Gailmard & Patty show that the principal's incentive to insert a stovepipe may be ambiguous when the agent may affect not only the provision, but also the generation, of policy-relevant information.

## DELEGATION

The study of delegation focuses on the grant of authority from one actor to a second, who makes a decision or takes an action on behalf of the first. Thus, there are two dimensions of the classical delegation problem: (*a*) whom the delegator should choose as a delegate and (*b*) how much discretion the delegator should grant to the delegate. The principal faced with the delegation problem may be more constrained on one of the two dimensions than the other. Two polar cases regularly occur in political institutions: in some cases, the discretionary authority of the position is fixed (or at least beyond the direct control of the delegator), so the choice to be made is whom to appoint to the position; in other situations, the appointee is fixed and his or her discretionary authority must be chosen by the principal.<sup>10</sup>

### A Canonical Model of Delegated Discretion

A seminal formal contribution in this literature is that of Holmström (1984). This model of discretion is essentially identical to the core model of statutory discretion developed by Epstein & O'Halloran (1994) and Epstein & O'Halloran (1999) and very similar in spirit to that developed by Huber & Shipan (2002). In Holmström's model, the information structure, decision space, and

<sup>10</sup>Bendor et al. (2001) provide an excellent review of much of the literature published in the last few decades of the twentieth century.

preferences are identical to those of the Crawford-Sobel cheap talk model. Specifically, an agent is perfectly informed of  $\omega \sim [0, 1]$  according to a uniform distribution, and  $x \in \mathbb{R}$  is an outcome over which quadratic utilities are defined. Although  $x$  is the key object in preferences, it is not a choice variable; rather, policy  $p = x + \omega \in \mathbb{R}$  is subject to direct choice. Thus,  $\omega$  mediates the link between policy choices and outcomes.

Holmström assumes a principal can delegate a connected subset of the policy space  $\mathbb{R}$ —a “discretionary window”—to the expert agent, from which the agent can choose any policy it wishes. The principal and agent have fixed, exogenous, and commonly known ideal outcomes. Thus, this model essentially takes the Crawford-Sobel model and allows the receiver to delegate authority to the sender instead of receiving a message and choosing a policy on that basis. This is a pure “adverse selection” or hidden information model; the principal is able in a sense to control the costs of various policy choices directly (those outside the discretionary window are infinitely costly). Epstein & O’Halloran and Huber & Shipan have each leveraged this model, or one very similar in spirit, to analyze statutory discretion, with a bureaucrat playing the role of agent and Congress playing the role of principal.

The chief result of the Holmström (1984) model is the intuitive comparative static that as the ideal outcomes of principal and agent converge, the principal delegates more discretionary authority over policies. It has also been shown (Alonso & Matouschek 2008, Gailmard 2009a) that the assumption that discretionary windows are connected subsets of  $\mathbb{R}$  is not restrictive: it is optimal for the principal to create discretionary windows with no “gaps” whenever it is optimal to grant nonzero discretion to the agent.

**Extending the theory of political delegation.** Holmström’s model was independently articulated by Epstein & O’Halloran (1994), who further extended it to allow for ex post legislative review and for “fire alarm” oversight in the sense of participation by interest groups (Epstein & O’Halloran 1996). It also forms the core of the “delegation game” in Epstein & O’Halloran (1999). From there, the model and its close relatives quickly became a standard model of statutory discretion for agencies. One reason for this is that the model captures, in a sparse and analytically tractable framework, the central normative dilemma of administrative policy making: how to best leverage (presumed) administrative expertise in a way consistent with the interests of legislators. The model builds in a rebuttal to concerns of “abdication” of legislative authority to bureaucrats (Lowi 1979), because it is impossible in the discretion model for the legislature to be better off with lower discretion than the agency enjoys in equilibrium.<sup>11</sup> Another reason for the model’s popularity is that it is sparse enough to admit of numerous extensions, and many have been pursued in the literature.

Gailmard (2002) considers the possibility that the agent might subvert legislative dictates by choosing policy outside the discretionary window. In this model, the agency’s cost of choosing any policy inside the window is 0, and it faces an exogenous cost of stepping outside the window, which gets higher the further outside it steps. Gailmard shows that this subversion leads a rational legislature to reduce its discretionary grant to an agency and might lead it to forgo agency policy making (and its attendant expertise) altogether. Ironically, therefore, agencies would commit to prevent themselves from subverting legislative dictates if they could, even though, ex post, they are better off subverting when possible.

<sup>11</sup>This is far from universal in the formal literature on bureaucracy. Some notable contributions point out that bureaucratic discretion may arise from the configuration of preferences, and specifically conflict, among multiple principals [often called “bureaucratic drift,” as identified by McCubbins et al. (1987) and elaborated by Hammond & Knott (1996)].

The extension of the canonical discretion model by Volden (2002) points up the importance of institutional context, in this case separation of powers, for the implications of the basic model. Volden models the grant of discretionary authority as requiring both legislative proposal and presidential approval. Because of this, grants of discretion may be difficult for Congress to “take back” when its political conflict with agencies changes, and of course Presidents may have a difficult time obtaining new authority for favored agencies when they are in ideological conflict with Congress. As a result, the canonical model’s implicit assumption that bureaucratic discretion always reflects the interests of a political principal is attenuated when there are multiple principals who must all agree on changes in discretionary authority.

**The “ally principle.”** Holmström’s model and subsequent elaborations dealt with a case where the agent’s preferences (i.e., ideal outcome) and expertise (i.e., knowledge of  $\omega$ ) are exogenous. Bendor & Meirowitz (2004) consider a complementary issue: what preferences does the principal in a delegation game prefer the agent to have?<sup>12</sup> Their analysis focuses mainly on what the authors dub the ally principle: a principal is made best off by appointing as his or her agent the individual whose preferences over outcomes are most similar to those of the principal. Bendor & Meirowitz demonstrate that the ally principle, though intuitive, is more difficult to recommend than it seems. The notion of an ally is somewhat ambiguous once one distinguishes between a potential delegatee’s policy preferences and how he or she will behave if appointed. As usual, the details of the delegation problem—such as whether the agent must exert effort to become informed, whether the principal can revisit and revise the agent’s decision, and so forth—are central to exactly characterizing where the equivalence between policy preference-based notions and (strategic) behavior-based notions of “ally” hold and where they break down. However, a useful reference point in conceptualizing the difficulty is the classic free-riding problem that results when the agent must exert effort *and* the principal will have the opportunity to revisit and revise the agent’s decision. In such cases, the principal might prefer to appoint an agent whose policy preferences differ from the principal’s because an agent who shares the principal’s policy preferences cannot be induced to exert costly effort if the agent knows that the principal will ultimately “do the work.”

In the same spirit, Bertelli & Feldmann (2007) develop a spatial theory of presidential appointments. Their results indicate the importance of considering the potential need for bureaucrats to negotiate with constituents when evaluating the degree to which the ally principle describes the President’s optimal choice of political appointees. Bertelli & Feldmann show that, in such situations, Presidents may be better served by appointees whose personal policy preferences represent a credible commitment to act in such a way as to mitigate the policy influence of organized interests among constituents. A qualitatively similar conclusion is reached by Prendergast (2007), who considers the possibility that bureaucrats may have intrinsic policy motivations above and beyond any traditional extrinsic (e.g., monetary) motivations. Prendergast’s conclusions are complementary to those of Bertelli & Feldmann (2007) in that they indicate a potential advantage from the hiring of bureaucrats with biased policy interests.<sup>13</sup> Furthermore, Prendergast’s results illustrate that the

<sup>12</sup>Bendor & Meirowitz focus mainly on the single-principal case (as does almost all the literature), though they do consider situations with multiple principals (“bosses,” in their parlance). They restrict attention throughout to delegation to a single agent, again as most of the literature does. Each of the various combinations one might form from the frameworks of Bendor & Meirowitz (2004) and Ting (2002, 2003)—for example, combining the questions of whom and how many to appoint—present natural next steps in this literature.

<sup>13</sup>The results are also complementary to those of Gailmard & Patty (2007), discussed below.

optimal choice of bias may depend on the relationship between the constituents' policy goals and those of the political principal.

### Why Delegate? Delegation versus Communication

Despite the similarities of the strategic environments they capture, the Crawford-Sobel and Holmström models remained relatively isolated from one another until a seminal paper by Dessein (2002) showed their fundamental linkage. Dessein asked when and why a principal would prefer to extract information from an agent by eliciting cheap talk messages, and responding accordingly, versus delegating authority in the sense of a discretionary window. Dessein grappled with one of the classic questions in studies of bureaucratic delegation—why we have it at all. The question of why a principal delegates authority at all has been a recurring theme in the formal political science literature on bureaucracy since its inception (see, e.g., Fiorina 1982).

Dessein showed that the principal would prefer playing the delegation game with the expert over playing the cheap talk game, whenever their ideal outcomes are sufficiently close together that informative communication takes place. The reason for this is simple but has far-reaching consequences: delegation entails a greater commitment by the principal than cheap talk does to let the agent obtain rents from using his or her expertise, and therefore the agent is more willing to use it under delegation. Under the delegated discretion model, there is a range of states  $\omega$  such that the agent is able to pick his or her exact (conditional) ideal policy—namely, when that policy (i.e., the one that exactly achieves the agent's ideal outcome, given  $\omega$ ) is in the discretionary window. The principal, of course, can design the discretionary window so that, in expectation, the policy outcome equals the principal's ideal outcome; given that, the greater use of the agent's information simply implies lower variance of outcomes than occurs in the most efficient equilibrium of the cheap talk game.

An interesting implication of this result is that, at least in some decision environments, principals would prefer to commit *not* to oversee their agents in the sense of exercising any authority to revise their decisions. In the discretion model, the agent's discretion is irrevocable; the principal cannot observe a policy choice, infer the value of  $\omega$  from it, and revise policy to the principal's own conditional ideal policy. This is essential for discretion to have desirable incentive properties for the agent to reveal information that the cheap talk model cannot match. In fact, if the principal can revise the agent's policy after observing the value of  $\omega$  implied by policy  $p$ , the discretion model collapses exactly to the cheap talk model. The agent knows full well that by choosing  $p$ , the agent is really simply communicating a message to the principal about the value of  $\omega$ ; thus, information will be conveyed in exactly the same degree as in the cheap talk model.

Dessein (2002) assumed that the agent's discretionary window was exogenously fixed and encompassed the entire policy space. Gailmard (2009a) compares delegation and cheap talk when discretionary windows are optimally tailored to the preference conflict between principal and agent. In this case, the principal's strict preference for delegation extends to all levels of preference conflict such that nonzero discretion is optimally granted to the agent.

Alesina & Tabellini (2007, 2008) consider another version of the "why delegate" question: when is it preferable for a legislature to delegate policy-making authority to unelected bureaucrats? Their models demonstrate the importance of relative expertise of bureaucrats [which echoes a long line of research on this topic, e.g., Epstein & O'Halloran (1999)], complementarities in multitask environments, and policy uncertainty. The framework employed by Alesina & Tabellini (2008) is distinct from that used in most other works in this area because it considers an infinite-horizon delegation problem and allows for an agent's expertise to vary across time.



## Other Themes

Ting (2002, 2003) considers the structure of bureaucratic policy-making institutions. The match between agencies and tasks within bureaucratic policy making is frequently a “many-to-many” relationship in the sense that individual agencies generally perform multiple tasks and many policy areas fall within the jurisdiction of multiple agencies. A unifying theme for Ting (2002, 2003) is the challenge that imperfectly controlled and strategic bureaucrats present to a political principal within uncertain policy environments. Central to how a given institutional structure will perform is the complementarity or substitutability of effort between agents and/or tasks. When considering whether to assign two agencies joint, overlapping responsibility for a given policy area, a principal needs to weigh the impact of potential competition and/or free-riding. Similarly, when a principal is choosing whether to assign policy-making authority for two policy areas to a given agency, Ting’s model illuminates the importance of ex ante budget control in considering how to “bundle” tasks for a given agency with preferences that differ from the principal’s.

McCarty (2004) and Crombez et al. (2006) each consider institutional design issues in separation-of-powers systems. Their results and analyses focus significant attention on the importance of commitment issues in hierarchical decision making. Although their models are motivated by different substantive questions, their conclusions are complementary and foundational: in strategic situations, an executive (such as an agency head, the floor membership of a legislature, or a President) can gain by restricting his or her (or their collective) ability to intervene in the choice of a final policy outcome.

Stephenson (2006b) presents a model of the differences between administrative and judicial policy making and considers under what conditions one of these two venues is superior. He differentiates the two implementation venues on the degrees of consistency across issue (sub)areas and through time. Administrative agencies, Stephenson argues, are more consistent (ideologically stable) across issue areas, whereas the principle of *stare decisis* and reliance on precedent in common-law systems implies that judicial rulings will exhibit greater ideological stability through time. Within this setting, a legislature siting interpretive authority must choose either intertemporal risk with interissue consistency or intertemporal consistency with interissue risk.

## Accountability, Transparency, and Oversight

An important subsidiary question prompted by the decision to delegate is the proper use of this authority by the agent, and in particular, a principal’s ability to ensure what it understands as “proper” use of the authority. Two important characteristics of interest in this section are the accountability of the delegate to the principal(s) and the transparency of the delegate’s decision-making process.

Accountability in the standard principal–agent setting requires rewarding or punishing the agent for the degree to which his or her choice of action is consistent with what the principal would have him or her do in the realized state. Thus, importantly, accountability requires not only that the principal have the ability to reward or punish the agent; the principal must be able to condition this reward or punishment on the match between the agent’s choice and the information the agent had about the state of the world when he or she made the choice.

The agent’s decision-making process is transparent (to the principal) when the principal has (and knows that he or she has) all of the information that the agent had when the agent made his or her policy choice. Such a situation is a platonic ideal, of course, because frequently one of the key pieces of information held by the agent—namely, the agent’s own motivations or intent—is inherently unknowable by the principal. Nonetheless, in many situations, the notion of degrees of

transparency can be fruitfully operationalized. In such situations, it is important to consider the effect of increased transparency on the quality of decisions made by the agent. Finally, transparency and accountability are clearly intertwined: holding an agent accountable for his or her decisions is difficult without at least a modicum of transparency.

Stasavage (2003, 2007) considers the effects of transparency on the quality of policy decisions. Increased transparency can be beneficial—such as when it allows an agent to establish a reputation for having “responsible” policy preferences (e.g., Stasavage 2003)—or it can be detrimental insofar as it forces an agent to make a nontrivial trade-off when choosing between the most efficient policy and the most popular one (e.g., Stasavage 2007).

Accountability is useful only to the degree that one has some expectation about how effective a policy maker *can* be. Prendergast (2003) confronts the question of whether bureaucratic policy making should be expected—even under the presumption of optimal institutional design—to make efficient decisions. The starting points for the analysis are that (a) government agencies are frequently granted discretionary authority in policy areas in which voters tend to choose inefficient outcomes and that (b) citizen complaints are a traditional *lingua franca* of bureaucratic oversight by legislatures, executives, and courts (e.g., McCubbins & Schwartz 1984). Accordingly, Prendergast shows that the optimal responses by bureaucrats in such situations include the ignoring of legitimate voter complaints, “overmonitoring” in some policy areas, unnecessary delay of policy decisions, and oversight characterized by an anticonsumer bias.

Stephenson (2004) considers judicial oversight and government deference to judicial review. He shows that a key determinant of whether the government should defer to the judiciary is the relative informativeness of government support for a policy compared to the similar informativeness of judicial opposition. When the judiciary’s opposition is sufficiently dispositive when compared to the government’s support for a given policy, voters will have an incentive to punish the government for ignoring judicial rejection of a policy. Similarly, altering the voters’ perceptions of the reliabilities of the support/opposition of the government/judiciary to a policy leads to equilibria that exhibit other empirically observed behaviors such as judicial “rubber stamping” and governmental “buck passing” to the judiciary.

Maskin & Tirole (2004) also tackle the question of under what conditions it is preferable for an elected politician to directly exercise policy-making authority rather than to delegate it to an unelected administrator.<sup>14</sup> They point out that the power to hold a policy maker accountable for his or her actions (e.g., through periodic elections) has at least two potential benefits for voters: (a) ex post removal of incompetent/incongruent officials and (b) provision of ex ante (or, perhaps more accurately, interim) incentives for the exertion of effort on the electorate’s behalf. However, these benefits come at some (potentially large) cost, and Maskin & Tirole’s models specifically and clearly indicate the importance of the voters’ abilities to monitor the (efficacy of the) actions taken by the policy maker in determining whether that policy maker should be subjected to direct electoral supervision. Most importantly, there are two potential (nonexclusive) forms of agency loss that emanate from electoral selection and retention of a policy maker whose decisions are at best imperfectly observed/evaluated by his or her constituents. The first is the provision of an incentive for the policy maker to bias his or her decisions as a function of the observability/popularity of the decision (a bias termed *pandering* by Maskin & Tirole). The second loss is more classically “political” in the sense that it flows from the multiplicity of principals in electoral settings: a voter

<sup>14</sup>Maskin & Tirole (2004) label the administrator a judge, but this appears to be merely for convenience; their model does not represent any of the aspects of judicial decision making that distinguish it from administrative/bureaucratic decision making.

who would hold a policy maker accountable through electoral means needs to recognize that the electoral incentives may in equilibrium be “provided” by other voters whose policy preferences diverge from his or her own. Accordingly, viewed either at the individual or aggregate level, the optimal mechanism for holding a policy maker accountable depends on the distribution of policy preferences within the electorate.

Wiseman (2009) presents a model of preclearance, a potentially important activity carried out in the US federal government by the Office of Information and Regulatory Analysis (OIRA). Wiseman asks why Congress has sustained the assertion of executive imprimatur with respect to the exercise of legislatively legitimated regulatory actions. His answer is that OIRA preclearance represents a potentially Pareto-improving institutional shift by providing a last stop for review of the match between a proposed policy and the underlying state of the world. Wiseman leverages a key feature of many, if not most, separation-of-powers systems: in addition to potentially having different innate policy preferences, the legislature and executive branches also have different constituencies. According to the logic of Wiseman’s model, if altering policy is costly to the OIRA, there will be situations in which the possibility of OIRA review will lead the agency to strategically shade policy closer to Congress’s policy goals.

Shotts & Wiseman (2010) study the accountability effects of a particularly blunt tool—replacing an agent—in a hierarchy charged with enforcement activity. A principal appoints an agent to exert effort on enforcement of a statute or regulation, but the principal does not directly contract over that effort. Instead, the principal’s lever to influence the agent’s actions is the threat of replacement of the agent. The principal and agent have conflicting interests, both over the amount of effort exerted by the agent (the agent faces effort costs the principal does not) and over the value of enforcement per se (which captures an element of ideological conflict; e.g., Occupational Safety and Health Administration inspectors may value workplace safety enforcement more than an ideologically conservative President or OSHA administrator does). Shotts & Wiseman show that the threat of replacement can be very effective for inducing the agent to follow the principal’s wishes—specifically, when the principal and agent are ideologically distant. In this situation, the agent realizes that his or her replacement would pursue a very different policy agenda than the one preferred by the agent. Thus, the ideologically distant agent realizes he or she must exert sufficient effort to satisfy the principal or risk being replaced by an ideologically close agent, who will be able to capture more rent because replacement will be less costly for him or her.

Gailmard (2009b) focuses on the effect of multiple principals or common agency on oversight and the transparency of bureaucratic action. His model is one of pure adverse selection in the mold of Niskanen (1971)—bureaucrats produce an output at a marginal cost unknown to legislative principals. But each principal, e.g., a committee in the House or Senate, has the opportunity to obtain direct information about the bureaucrat’s marginal cost through oversight and can use this information to tailor budgetary transfers to the bureaucrat (which, when they exceed the cost of production, are valued by the bureaucrat as rent). In this model, the legislative principals have identical interests in holding down the cost of bureaucratic operations but also face opportunity costs of exerting effort on oversight. As a result, the organizational structure of the principals—as in the US Congress, composed of decentralized units with independent oversight jurisdiction—leads to an inefficiently low level of oversight. A natural extension of this model would allow for ideological conflict among the principals, so that they do not necessarily have a common interest in oversight. In that case, it would be possible to obtain inefficiently *high* levels of oversight in equilibrium, which presumably would carry the opportunity cost of less legislative time spent on some socially valuable activity (such as identifying important public problems and deliberating on solutions to them).

## EXPERTISE

A long-standing justification for delegating the authority to make public policy is the possibility of appointing an agent whose policy-making expertise is greater than that possessed by the elected principal(s). For many authors and for understandable reasons, the nature of this expertise differential was of secondary importance so long as it existed. Recently, however, more attention has been focused on the question of when, if ever, such a differential can actually be leveraged. Three important considerations immediately emerge. First, policy-making expertise is rarely bestowed at birth, and it is even rarer for expertise to emanate directly from either legislative dictate or executive decree. Second, what *is* expertise? This issue is not simply theoretical: how can a principal measure an agent's policy-making ability? Finally, how can a principal credibly commit not to expropriate the agent's expertise after the agent (perhaps partially) reveals his or her information through his or her choices?

The formal theory literature on expertise has expanded significantly during the past decade. Some papers have drawn substantive links more tightly with legislatures whereas others have more closely associated themselves with administration and bureaucratic policy making. From a theoretical standpoint, however, this is a distinction without a difference—both relationships (i.e., floor/committee and elected politician/unelected bureaucrat) are conceived as principal-agent problems.

### Expertise Acquisition

Although it was applied to congressional committees and procedures, the classic model of expertise acquisition was provided by Gilligan & Krehbiel (1987), who examine the granting of a take-it-or-leave-it “closed rule” to a legislative committee as an incentive for the committee to acquire expertise prior to drafting its legislative proposal.

Gailmard & Patty (2007) consider the complementary question of whether a legislature might grant discretionary authority to its agent upon the acquisition of expertise. They demonstrate that not only can the conditioning of an agent's future discretionary authority induce expertise acquisition by policy-motivated agents, but this form of “contract” can serve as a filter by which non-policy-motivated (and correspondingly harder-to-motivate) potential agents voluntarily demur and exit the principal-agent relationship. Gailmard & Patty adopt an approach that differs from Gilligan & Krehbiel's (1987) in that the “contract” between the principal and agent is required to satisfy sequential rationality on the part of the principal: the principal cannot commit himself or herself to grant discretion to an expert agent in a way that he or she would prefer to renege on after the agent acquires expertise.<sup>15</sup> Finally, Gailmard & Patty consider the effect of an exogenous (and expertise-independent) probability that the agent will be terminated prior to being granted his or her second-period discretion. Intuitively, the ability of any fixed future grant of discretion to induce expertise acquisition declines as such termination becomes more likely.<sup>16</sup>

Stephenson (2007) develops a model of institutional design with a focus on expertise acquisition in which the principal must choose the cost incurred by an agency to adopt a new regulation. His model illustrates the key role of what an uninformed agency would do (i.e., promulgate a regulation

<sup>15</sup>By assuming that the state of the world is independently distributed in each time period, Gailmard & Patty obviate the credible-commitment problem discussed below. However, the credible-commitment problem reemerges if the state of the world is not independently distributed across time.

<sup>16</sup>Construing this probability of termination as the inverse of civil-service tenure protections, Gailmard & Patty then link the model's results with the emergence of civil-service reform in modern bureaucracies, a topic they take up in much greater detail in Gailmard & Patty (2012).

or not) in determining the effect of this “enactment cost” on the agency’s choice of whether to acquire expertise. If the agency would make policy even in the absence of expertise, then higher enactment costs induce the agency to acquire more expertise, whereas higher enactment costs decrease the level of expertise acquired if the agency would demur when uninformed. Accordingly, any principal overseeing the agency is forced to trade off his or her desire to influence the agency’s policy goals against the desire to induce the acquisition of expertise.

Stephenson (2008) extends the study of institutional design by considering the social benefits and costs of various degrees of bureaucratic insulation from political control. Most importantly, Stephenson notes that electoral outcomes are a coarse measurement of the preferences of the citizenry. Accordingly, the political goals of an incumbent will generally not be identical to those of the median voter. Thus, a bureaucracy partially insulated from the incumbent’s pressures can insulate the median voter against electorally induced policy uncertainty. In Stephenson’s framework, the trade-off faced by a median voter considering the degree of bureaucratic insulation reduces to the classical one of reducing the variance of policy outcomes by accepting greater divergence in the mean location of those outcomes.

## The Nature of Expertise

A model of policy-making expertise requires a model of policy making. The most common (though not the only) approach in this literature has been to conceive of policy making as taking place in a unidimensional environment represented by (possibly a subset of) the real line,  $\mathbf{R}$ , over which the principal and agent each have quadratic preferences. In addition, a common approach is to model the determination of policy as an additive function of the policy choice,  $x \in \mathbf{R}$ , and an exogenously determined state of the world,  $\omega \in \mathbf{R}$ . Formally, the policy outcome (which is what both players are assumed to care about),  $z$ , is determined as follows:

$$z = x - \omega.$$

Expertise, per se, has frequently been modeled as a binary variable: an agent is either an expert or not. Typically, an agent is an expert if he or she is completely aware of the state of the world,  $\omega$ , whereas a nonexpert agent is presumed to have the same information about  $\omega$  as the principal. In other words, an expert agent can completely foresee the outcome of any policy choice, and a nonexpert agent cannot, in isolation, make a policy choice that leaves the principal better off than if the principal simply set policy on his or her own behalf. This binary conception of expertise is parsimonious and obviates some aspects of modeling that are not necessarily of interest to a broad political science audience.

## Capacity versus Expertise

Huber & McCarty (2004), Lewis (2008), and Ting (2009) each tackle the question of bureaucratic capacity. Capacity, as a concept, has a long history in the study of bureaucracy. It is a somewhat slippery notion of the ability to successfully and reliably implement a desired policy outcome. It is intimately related to the notion of expertise if one adopts the view that expert agents are those who can reliably match policy choices with the true underlying state of the world. Capacity, however, is typically distinguished from expertise by the temporal occurrence of imperfections in implementation. A lack of expertise manifests itself prior to the choice of policy by an agency, whereas a lack of capacity affects policy outcomes even if the policy choice is perfectly matched to the underlying state of the world.

Huber & McCarty, Lewis, and Ting take complementary approaches in their attempts to formalize the concept of capacity. Huber & McCarty (2004) operationalize a low-capacity agency as one that cannot reliably control the outcomes that flow from its choices. In a nutshell, capacity in their framework is inversely proportional to the variance of policy outcomes, conditional on any policy choice by the agency. Low-capacity bureaucrats generally have a smaller incentive to faithfully implement legislative dictates.

### Committing Not to Expropriate Expertise

The commitment problem that arises in modern models of principal–agent situations has attracted renewed attention. It is frequently the case that power granted can be withdrawn: upon observing the choice of an agent, the principal may be able to revisit and revise the decision based on what, if anything, the principal learned about the agent’s private information from the agent’s choice. This classic commitment problem is the foundation of the key insights from the Crawford-Sobel model.

From a theoretical standpoint, the credible-commitment problem cannot be “solved” through the changes in *de jure* authority. After all, the principal will have a strict incentive to institute a legal/constitutional/contractual commitment not to revisit and revise an agent’s decision only when the principal will have a strict incentive to circumvent this commitment (e.g., repeal the law) after the agent’s choice—and the information contained therein—is revealed to the principal.

Assuming the existence of a third party who is (or, perhaps, can be incentivized so as to be) willing and able to enforce a *de jure* grant of unreviewable policy-making authority is merely begging the question of how to make commitments credible. Of course, this objection does not oppose the empirical or positive presumption that such a third party does in fact exist. Rather, such a presumption is equivalent to presuming that the degree to which the principal can update his or her beliefs after observing the agent’s choice is insufficient to justify revising it.

Before we set aside *de jure* means of obviating the credible-commitment problem, it is important to note that requiring multiple principals to unanimously agree on any revision can enhance the credibility of commitment to delegated authority (e.g., Keefer & Stasavage 2003). However, it is also important to note that the presumption that multiple principals can bind themselves to a unanimity decision rule is analogous to presuming the existence of third-party enforcer, this time with respect to the principals’ collective decision-making process.

Acknowledging the difficulties with *de jure* solutions to the credible-commitment problem, several scholars have recently focused on characterizing the class of situations in which the principal can credibly delegate *de facto* discretionary authority to an agent. For example, what are the (exogenous) features of policy-making expertise that imply that it will never be in the principal’s interest to revise the agent’s decision even when such an option is freely available to the principal?

Along these lines, Callander (2008) presents a new model of policy-making expertise. Callander notes the extreme nature of the principal’s commitment problem under the presumption that policy-making is governed by the additive shock model  $z = x - \omega$ . In a nutshell, if the agent is using a pure strategy to map  $\omega$  into a policy choice and the principal can observe the policy choice, then the principal can not only immediately infer the state of the world,  $\omega$ , but also directly compute the policy outcome that would flow from *any* policy choice. Similarly, Hirsch & Shotts (2012) extend the study of nonexpropriable expertise and its implications for the design of deference. Foremost among their conclusions is that, to the degree that the principal can commit to not expropriate the value of the agent’s expertise—something that is arguably possible in a wide array of policy areas for the reasons discussed above—granting monopolistic protections to the agent’s proposal may reduce the agent’s incentive to acquire expertise.

## CONCLUSION

The development and extension of formal models of the bureaucracy have grown significantly in political science, economics, and public administration. In this article, we have followed the recent direction of much of this literature and focused heavily on the various instantiations of asymmetric information within some kind of a principal–agent relationship. Even conditioning on those characteristics, there are many topics discussed in the existing (and developing) literature.

In addition to describing a family of models and theoretical results that are ready-made for many of the applications scholars in this literature have chosen over the past three decades, we feel that informational asymmetry is a key unifying aspect of this literature for substantive reasons. Regardless of whether one is interested in political conflict between the branches, efficient provision of public services, or representation of varied interests in everyday governance, a key reality of public administration is that the myriad of individuals responsible for decision making are very rarely endowed from the outset with all potential and desirable policy-relevant information and/or expertise. Accordingly, administration in most circumstances can be accurately described as an agency problem wrapped in a penumbra of policy uncertainty.

In terms of the future of the literature, this article has provided some new results that we believe align favorably with a well-defined (and, in our minds, ongoing) “agenda.” Much of the literature has focused (in our opinion quite reasonably) on questions of institutional design. However, until very recently, many of these questions have been asked from a bird’s-eye level. A potential next step in the field, then, is to begin formalizing in more fine-grained detail considerations of actual administration. Such considerations include how priorities are set within and across agencies;<sup>17</sup> how courts and other review organs evaluate and uphold, modify, or reject proposed administrative actions; and the varying forms of linkages between policy decisions and policy outcomes, including the role of institutional characteristics such as federal systems, outsourcing of provision to private contractors, and the role of public agencies in nongovernmental institutions such as financial markets.

## DISCLOSURE STATEMENT

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<sup>17</sup>Such a topic would naturally lead, it would seem, to a renewed focus on issues related to the management of both politics and administration within the executive branch, as considered by Knott & Miller (1987), Skowronek (1993), Moe & Howell (1999), and Howell (2003), among others.

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