

Article

A Female Policy Premium? Agency Context and Women’s Leadership in the U.S. Federal Bureaucracy

Rachel Augustine Potter*, Craig Volden*

*University of Virginia

Address correspondence to the author at rapotter@virginia.edu

Abstract

Although there are descriptive and substantive benefits associated with women serving in leadership posts in the bureaucracy, we ask whether there is a policy benefit associated with women’s leadership. Simply put, is there a policy premium to having women as bureaucratic leaders? We focus on agency rulemaking, a policymaking activity conducted by nearly all federal agencies. Across three presidential administrations, we find no evidence of an across-the-board premium associated with women’s leadership. However, our results are consistent with a *conditional policy premium*—wherein women leaders are particularly effective in advancing ambitious rules and in shepherding rules through to finalization—in agencies that have a working environment that is supportive of women and, to some extent, in agencies that focus on women’s issues. One key implication is that, rather than working to tear down “glass walls,” reformers would be better served by improving the workplace climate for women within agencies.

You succeed in Washington by collaborating. You can’t just think about your own agency, or your own goals. You have to please both sides of the aisle, while making sure you’re not outshining other officials, and persuading employees who don’t have to obey your orders...It takes a lot of humility.

Hank Paulson¹
Treasury Secretary (2006–2009)

Leadership of government agencies requires a distinctive skill set, one that involves the ability to navigate byzantine procedures, while also avoiding political quagmires. This is no easy task; as the above quote from former Treasury Secretary Hank Paulson makes clear, it is a job that requires both *collaboration* and

humility. These two traits are more commonly associated with women than men (e.g., Barnes 2016; Eagly and Johnson 1990; Holman and Mahoney 2018), suggesting that, in the bureaucratic context in particular, female traits may make for particularly effective leaders.

Research on the role of women as bureaucratic leaders supports the idea that having women at the top can yield discernible benefits; for instance, having a woman in a leadership post is associated with favorable outcomes for women served by the agency (Keiser et al., 2002; Liu and Banaszak 2017; Saidel and Loscocco 2005; Wilkins 2007), as well as for other women who work within the agency (Draganova 2018; Funk et al., 2019). However, the advantages of having women as bureaucratic leaders in terms of *policy performance* is not well understood. As Dolan (2001) observed nearly two decades ago, we have considerably more insight

1 Quoted in Duhigg (2017).

into the recruitment patterns² and qualifications of female agency heads, than information about whether their presence meaningfully affects policy outputs.

In this article, we investigate whether the circumstances that Secretary Paulson identifies really do favor a female leadership style when it comes to policy production. In addition to comparing base differences between male and female leaders, we build off existing work that suggests that the context in which women work can influence their leadership performance (Barnes 2016; Barnes and O'Brien 2018; Dolan 2000, 2002, 2004; Newman 1994; Sabharwal 2015; Volden, Wiseman, and Wittmer 2013). Are there agency contexts that lead to a female performance premium? And, if so, what are they? We explore these questions using a new data set of nearly 500 agency leaders over three recent presidential administrations. Our focus is on the regulations produced by these agencies. Although outsiders often consider regulation to be an esoteric process, it is an activity undertaken by nearly all bureaucratic agencies. Additionally, since administrative regulations carry the full force and effect of law, rulemaking is an avenue by which agency leaders can leave a lasting mark on public policy. Rulemaking is thus ideal for studying the systematic effect of female leaders across a broad swath of agencies.

Our analysis shows that there is indeed a female policymaking premium in the federal bureaucracy—but that it is conditional. That is, we find no evidence of an across-the-board premium associated with women's leadership. Our results, however, are consistent with a *conditional policy premium*, wherein women leaders are particularly effective in certain contexts. Specifically, compared with their male peers, women leaders are successful at advancing ambitious rules and in shepherding new rules through to finalization in two contexts: in agencies that focus on women's issues and in agencies that have a working environment that is supportive of women. Whereas our results with respect to the agency's working environment are highly robust, our results on women's issues receive mixed support across a variety of specifications. We conclude with a discussion of the implications of these findings for the so-called "glass walls" within public administration that silo women into certain areas of the workforce.

2 For instance, women are underrepresented at both the rank-and-file and the leadership levels of the federal bureaucracy. Although women made up approximately 47% of the workforce nationwide in 2016, they constituted only 43% of the federal civilian workforce (OPM FedScope). And in 2017, President Trump appointed just four women (16.7%) to the top 24 Cabinet and Cabinet-equivalent positions. Although Trump's appointment strategy was notable for its lack of diversity (Lee, 2017), no president has come close to approaching gender parity in appointments to top agency posts.

The Female Leadership Difference

Public administration scholars and political scientists alike have studied the role of women as leaders of bureaucratic agencies in particular contexts. Several findings have emerged from this enterprise. First, a large body of work focuses on the nomination process and when and where women are selected to lead. Much of this work is cross-national and finds that women are appointed to bureaucratic leadership posts with greater frequency under left-leaning governments (e.g., Krook and O'Brien 2012) and also that they are allocated portfolios in policy areas that are traditionally considered "feminine," such as health, education, and child welfare (e.g., Davis 1997; Escobar-Lemmon and Taylor-Robinson 2009; Krook and O'Brien 2012; Reynolds 1999; Studlar and Moncrief 1999). In the United States, Smith (2014) shows that these patterns are repeated among leaders of 12 federal regulatory agencies.

A second strand of the literature focuses on the downstream consequences of having a female agency head and generally reports positive benefits from descriptive representation (Dolan 2000; Keiser et al., 2002; Saidel and Loscocco 2005; Wilkins 2007). In a cross-national study, Liu and Banaszak (2017) show that having more women in bureaucratic leadership positions is associated with societal increases in women's political participation. And, on the municipal level, Funk et al. (2019) show that electing a female mayor "increases the average wages of women bureaucrats and decreases the gender wage gap in the bureaucracy." However, in a study of child support enforcement, Wilkins and Keiser (2004) find that having more women in leadership roles is associated with better outcomes for women but that this effect is not replicated in other less gendered policy areas.

These studies highlight the benefits of female leadership to agency stakeholders largely in terms of constituent service and policy outcomes (i.e., in terms of policy implementation). They do not speak to whether female agency leaders make different policy choices than their male peers (but see Dolan 2002) or, more specifically, whether their placement in certain agencies (e.g., those that focus on women's issues) affects their policy performance. Marrying the two strands of the literature together, we have limited insight into whether having female agency leadership changes agency policy outputs in a meaningful way.

There are, however, good reasons to expect that women might perform differently than men in policy leadership roles. Across a variety of disciplines, scholars have probed the differences in leadership styles between the sexes. These studies yield a similar set of adjectives to describe women's approach to leadership, including "altruistic" (Andreoni and Vesterlund 2001),

“collaborative” (Barnes 2016), “collegial” (Lawless, Theriault, and Guthrie 2018), “cooperative” (Lawless 2015), “democratic” (Eagly and Johannesen-Schmidt 2001), “long-term oriented” (Silverman 2003), “participative” (Eagly and Johnson 1990), “results-oriented” (Dittmar et al., 2017), and “rule-abiding” (Portillo and DeHart-Davis 2009). Men, on the other hand, tend to be described using terms like “aggressive” (Kathlene 1994), “autocratic” (Eagly and Johannesen-Schmidt 2001), “competitive” (Duerst-Lahti 2002), “decisive” (Rosener 1990), “directive” (Eagly and Johnson 1990), “instrumental” (Duerst-Lahti 2002), and “transactional” (Rosener 1990).

In other institutional settings, research suggests that women are distinct in their policy entrepreneurship. For instance, studies focusing on lawmaking patterns show that female legislators are more effective than men—in terms of introducing legislation and seeing it through to become law—at least when women are in the minority party (Volden, Wiseman, and Wittmer 2013). Similarly, female candidates who face higher barriers to entry when running for office outperform their male peers once elected to Congress, in terms of bringing federal spending to their districts and sponsoring legislation (Anzia and Berry 2011). Female legislators also behave differently than their male peers, prioritizing women’s issues more (Barnes 2016; Swers 2002, 2013; Tamerius 1995) and feeling more empowered to speak up when it comes to these same issues (Pearson and Dancey 2011).³

The dearth of research studying female leadership and agency policymaking performance may arise from the difficulty associated with measuring bureaucratic policy performance. Although studies of legislative performance select from a menu of agreed-upon metrics of legislative success—bill sponsorship, bill passage rates, federal spending, etc.—the bureaucracy does not offer such readily comparable policy metrics. Although early scholars focused on maximizing agency budgets and “turf” (e.g., Niskanen 1971; but see Dolan 2002 and Opstrup and Villadsen 2015), these decisions are not entirely within bureaucrats’ purview. To date, the options for evaluating bureaucratic performance have been limited to individual policy areas (Johansen 2007; Meier, O’Toole, and Goerdel 2006) or limited to one

administration (Lewis 2007). We remedy this by offering new measures of agency performance based on the creation of new federal regulations. This approach allows us to closely investigate the role of female agency heads as policy leaders.

Leadership in Regulatory Policymaking

Evaluating leader performance in government agencies is difficult; unlike firms, government agencies do not maximize over one quantity. However, like legislators, agency heads oversee the creation of new law, albeit through the notice-and-comment rulemaking process instead of the legislative process.⁴ Notice-and-comment rulemaking is an administrative process that generally requires many steps, including the publication of a proposed rule in the *Federal Register*, an opportunity for public comment, and the publication of a subsequent final rule in the *Federal Register*.⁵ Once these steps are complete, the associated regulation carries the force and effect of law.

Rulemaking presents an ideal venue to study the effects of female agency leaders on policy performance for three reasons. First, nearly all agencies engage in rulemaking, meaning that it is possible to study this form of policymaking at a broad cross-agency level. Second, rulemaking is an opportunity for leaders to make a lasting mark on public policy. Finalized regulations are durable; repealing them requires undergoing the same time- and labor-intensive administrative process as creating them. As former EPA Administrator Anne Gorsuch Burford (1981–1983) once put it, “once you put a regulation on the books, it is unlikely that anyone will be able to change it” (Burford and Greenya 1986, 98). Third, agency leaders—by which we mean the mezzo-level head of a bureau⁶—have the ability to influence the trajectory of a rulemaking. Leaders can allocate greater or fewer resources in terms of staff time toward a rulemaking project. They can also smooth the political waters both within the agency and with external stakeholders. This is part of what Nou (2015) dubs “intra-agency coordination,” which is the often-overlooked ability of agency leaders to marshal internal agency resources to further the leader’s own regulatory agenda.

3 Female activism in this arena does not necessarily translate into success. Wittmer and Bouché (2013) suggest that greater involvement by female legislators may lead to greater spending in women’s policy areas, but this result may come at the expense of meaningful policy impact. Meanwhile, in lower state houses, Thomas (1991) finds that bills about women, children, and families were more successful (29% passage rate) when introduced by women, compared to those introduced by men (13%). In contrast, at the national level, Volden, Wiseman, and Wittmer (2018) find that, relative to men, legislative proposals sponsored by women in Congress in women’s policy areas are less likely to go on to become binding law.

4 We acknowledge the general difficulty of studying agency performance, since success may be unobservable; successful agencies may be the ones that avoid unfavorable or even catastrophic outcomes (Lewis 2018). Nonetheless, we note that the creation of rules has the potential to intentionally alter the course of public policy, which is one metric of successful leadership.

5 This is a generalization of the path that a proposed rule might follow; for an explanation of deviations from this path, see Potter (2019).

6 Prior research suggests that mezzo-level bureau leaders can have an important and lasting impact on a bureau’s trajectory (Carpenter 2001). To the extent that a subdepartment bureau-level leader is identifiable, we focus on that in our empirical results.

We focus on two distinct but related features of an agency leader's rulemaking performance: *ambition* and *execution*. By ambition, we mean the scope of the rulemaking projects that a leader pursues. Rules differ in their policy reach. Some regulatory proposals accomplish relatively banal feats, such as determining the allowable size range for the eyes in Swiss cheese, whereas others accomplish major policy changes, like establishing key pollution thresholds for greenhouse gas emissions (Potter 2019). Some leaders pursue ambitious regulatory proposals, whereas others do not; we look at whether gender explains some of the variation in leader ambition.⁷

In studying execution, we focus on whether an agency's leader is able to finalize the rules she proposes. Once a rule is proposed, there is no guarantee that it will go on to become a binding final rule and, indeed, many rules languish indefinitely at the proposed rule stage. A leader who wants to see a proposal become binding law must make sure that the proposal clears numerous procedural hurdles, including the administrative demands of notice-and-comment, as well as internal clearances within the agency or department and potentially sign-off by the Office of Information and Regulatory Affairs (OIRA), the White House clearinghouse for agency rulemaking. In addition to these procedural hurdles, a rule must also overcome potential political roadblocks from overseers in Congress and possibly the courts.

Agency leaders can affect the success—or failure—of their rulemaking projects. They can deploy greater or fewer resources toward rulemaking. When a proposed rule is prioritized within the agency, it stands a greater chance of reaching the final rule stage more quickly. Additionally, leaders can strategically employ procedures to help insulate a particular rule from political intervention and to help ensure that it ultimately becomes a binding final rule. For instance, Potter (2019) argues that agencies leverage their control over the timing of the publication of final rules, speeding up their publication when the political climate is favorable, and slowing it down to “wait out” a more adverse climate.

Women as Regulatory Leaders

There are several reasons to expect that women might outperform men in the context of both rulemaking ambition and rulemaking execution. Prior research suggests that women leaders tend to be more rule-abiding (Portillo and DeHart-Davis 2009), as they are more likely to have limitations placed on their discretion, and to hew more closely to organizational norms and procedures. In the context of rulemaking, this can be

an asset given the heavily procedure-bound process (Potter 2019); meticulously following these procedures is essential to creating a regulation that survives internal agency scrutiny as well as scrutiny from principals outside the agency.

Rulemaking is also an inherently collaborative activity. The successful initiation and completion of a rulemaking project involves dozens of people: the rule-writing team within the bureau, other component agencies within the department, departmental leadership, as well as active stakeholders outside the agency such as interest group leaders and officials at OIRA. Orchestrating a rulemaking effort is therefore a participatory exercise, one to which women, given their typical leadership styles (which, again, are frequently described as “collaborative,” “participative,” and “results-oriented”), may be particularly well suited.

Additionally, women report a higher sense of efficacy in terms of rulemaking-related activities. In a study of senior executives in the federal bureaucracy, Dolan (2004, 306) concludes that, overall, men and women “have fairly equal opportunities to influence the implementation and execution of the nation's policies.” Yet, she also reports that, compared with their male counterparts, women are significantly more likely than men to report being influential in terms of recommending changes to regulations, policies, or programs and to interpreting and applying laws, regulations, and policies (304). Together these arguments lead to the following hypothesis:

Gendered Rulemaking Hypothesis: Women leaders propose more ambitious rulemaking projects and see these projects through to execution at a greater rate than do men.

In considering the role of women leaders in regulation, former EPA Administrator Lisa Jackson (2009–2013) presents a case in point. Described as a “regulatory warrior” (Carey 2011), she “[pushed] through the toughest new air and water pollution rules in over two decades” (Schiffman 2013). During her 4-year tenure, Jackson oversaw the issuance of numerous major environmental regulations, including proposals to regulate mercury emissions from coal-fired power plants, set greenhouse gas emission standards for passenger vehicles, and establish a permitting program for the largest stationary emissions sources. Pursuing this agenda required her to overcome numerous obstacles, including significant court challenges and even opposition from President Obama at times (Childers 2012). Administrator Jackson's expansive activity in the rulemaking arena stands in stark contrast to her predecessor, Stephen Johnson, who is widely viewed to have overseen a caretaker regime. Although many differences distinguish these two agency leaders, one notable difference is gender. If Jackson's regulatory

⁷ Of course, under different administrations rulemaking receives more or less weight as a means of fulfilling policy agendas. We return to this point later.

pro prowess can be partially attributed to her gender, then it may fit into a broader pattern of a gender effect in bureaucratic policymaking.

Women as Regulatory Leaders on Women's Policy Issues

A key finding of research on women in bureaucratic leadership roles is that women are disproportionately selected to lead agencies that deal with policy issues that are traditionally considered to be "women's issues" (e.g., Barnes and O'Brien 2018; Escobar-Lemmon and Taylor-Robinson 2009; Krook and O'Brien 2012; Smith 2014). Evaluating the success of women in bureaucratic leadership posts that focus on these issues, however, has proven difficult given the lack of a consistent metric to evaluate bureaucratic outcomes across agencies. However, in other contexts such as legislatures, where metrics of success are more readily available (e.g., bill introduction, bill passage, bill cosponsorship) when women work on women's issues, they tend to outperform men (Barnes 2016; Swers 2002, 2013; Tamerius 1995; but see Volden, Wiseman, and Wittmer 2018).

Returning to Administrator Jackson at the EPA, although her success in environmental rulemaking is likely attributable to many of her personal qualities, the environmental arena may have enhanced the likelihood of her success because many scholars consider the environmental arena to be a women's policy issue (e.g., Little, Dunn, and Deen 2001; Reingold 2000; Thomas 1991, 1994). However, this example also underscores a key limitation to studying "women's issues" in this way; although many scholars classify environmental policy as a women's issue, others contest this classification (e.g., Escobar-Lemmon and Taylor-Robinson 2009; Krook and O'Brien 2012). Ultimately, what constitutes a women's issue rests on how that term is defined. We define it broadly here to mean an issue area that women tend to prioritize over other policy areas, although we consider alternate conceptions in robustness explorations below.

There are many reasons that women might excel when they work on these policy areas within the bureaucracy. Most directly, women may perform better in agencies that focus on women's policy issues simply because they are passionate about these matters and they have the opportunity to focus on them exclusively in these contexts (Banaszak 2010; Tamerius 1995). Peers and subordinates may also view women as having more authority in these policy domains, and women leaders may capitalize on these perceptions in order to accomplish more. Alternatively, when choosing a woman to lead an agency that has traditionally been the purview of women, the supply of highly qualified candidates may be large, suggesting that those who are selected to lead may be more qualified than women leaders in other types of agencies. For example, women are overrepresented in

the field of education, so a woman chosen to lead an education agency may have refined her skills over time in a very competitive female environment.

We believe that all of these mechanisms—and perhaps more—are possible and that all may enhance a female leader's rulemaking success in these contexts. Critically, all of these pathways point toward the same empirical implication:

Policy Issues Hypothesis: Compared with their male counterparts, women leaders in agencies that focus on women's policy issues propose more ambitious rulemaking projects and see these projects through to execution at a greater rate.

Women as Regulatory Leaders in Supportive Work Environments

Like all workplaces, some bureaucratic organizations foster the advancement of women throughout the organization and others do not (Dolan 2000). For instance, while there is a well-documented pay gap between men and women in the private sector, there is also a pay disparity in the federal sector, although it is not as stark and varies by agency (Draganova 2018). Similarly, some agencies attract and retain women throughout their ranks, whereas other agencies draw fewer women or relegate women to lower levels of the agency hierarchy. Simply put, some agencies are more *supportive* workplaces for women than are others. An agency that fosters a supportive work environment for women is one where women have achieved parity with men in terms of status, presence, and compensation. Is there a performance premium in terms of rulemaking when women lead these more supportive agencies?

Returning once more to Administrator Jackson's tenure at the EPA, her success at the agency may also owe to her leadership in the context of other women's success in the agency; the agency is supportive of women, as evidenced by women achieving equal status with men within the organization. At the leadership level, the EPA has effected gender parity with approximately half of its team leader posts filled by women.⁸ And, at the rank-and-file level, EPA's employees have approximate gender parity. Finally, as measured by the rank on the "General Schedule" (GS) federal pay scale, the gap in pay between professional men and women at the EPA is small relative to that in other federal agencies.

More generally, women are believed to achieve greater levels of success when they are put in collaborative environments with other women (Flabbi et al., 2019; Holman and Mahoney 2018; Karpowitz and Mendelberg 2014; Thomas 1991). Having a bloc of women at senior levels of an organization (Opstrup and Villadsen 2015; Wilkins 2007) or at the rank-and-file level (Dolan 2000;

⁸ EPA data are based on authors' calculations from data presented later in the article.

Gardiner and Tiggemann 1999) is associated with better outcomes for female leaders. There are several mechanisms that can potentially give rise to these outcomes. For example, in women-dominated (or supportive) environments, women may more effectively overcome structural barriers and attain political power (Barnes 2016). Alternatively, in the corporate context, Flabbi et al. (2019) argue that women leaders enhance firm performance as the share of female workers increases because female leaders are better able to interpret signals of productivity from female workers. Another possibility is that female subordinates may be more invested in the success of a female leader in these work environments and may give more of their time and talents; for instance, in the context of campaign contributions, Thomsen and Swers (2017) show that female Democratic donors are more likely to give to liberal female candidates over and above traditional predictors of giving, such as whether candidates are in competitive seats or in leadership positions.

Because rulemaking affords an opportunity to advance the agency's policy agenda, we expect that any or all of these mechanisms may enhance a female leader's rulemaking ability. Again, all of the mechanisms align with the following hypothesis:

Supportive Work Environment Hypothesis: Compared with their male counterparts, women leaders in agencies whose work environment is more supportive of women propose more ambitious rulemaking projects and see these projects through to execution at a greater rate.

Characterizing Bureaucratic Leadership

To investigate the effects of female leadership on agency rulemaking performance, we identified all executive branch agencies that issued at least one proposed rule over the 20 years between 1995 and 2014 (inclusive). We relied on the *Unified Agenda of Regulatory and Deregulatory Actions* ("Unified Agenda"), a semiannual accounting of agency rulemaking activities that is published in the *Federal Register*. From there we determined the agency that sponsored each proposed rule,⁹ and used publicly available resources to identify the leaders who staffed those agencies during this time period. The resulting data set includes thousands of proposed rules issued by 481 agency leaders at 142 agencies.

Our hypotheses focus on an agency leader's *ambition*, or how much of an impact they attempt to make

in proposing regulations, and their *execution*, or their ability to carry proposed policies through to enactment. To gauge these concepts, we create three dependent variables. The first, *Ambition*, is a continuous measure of each proposed rule's broader policy significance. This measure draws from Potter (2019) and is bound between zero and one (inclusive), with values closer to one indicating a more impactful proposed rule.¹⁰ For instance, a proposed rule issued by the Occupational Safety and Health Administration during the Clinton administration that would have required employers across the United States to adopt ergonomic standards in the workplaces scores high in terms of *Ambition* (0.716). Meanwhile, a proposed rule issued by the Office of Personnel Management during the Bush administration that adjusted the reimbursement rate for uniform purchases by federal employees scores low on *Ambition* (0.080).

The second dependent variable, *Execution*, captures a leader's ability to execute in the rulemaking realm. It is a dichotomous variable that takes on a value of one when the same leader who issued the proposed rule oversaw its finalization, and zero otherwise. Although agency heads generally do not serve long tenures (particularly leaders that are politically appointed), the average time between publication of a proposed rule and publication of a final rule is somewhere between 15 and 16 months (O'Connell 2011; Potter 2019). However, there is considerable variation and sometimes rules get finalized quite quickly. This means that a leader who makes finalizing a proposed rule a priority will likely be able to see it finalized on her watch. The third and final dependent variable combines the previous two, allowing us to evaluate the cumulative effect of leadership on rulemaking. *Ambitious Execution* is the ambition score of a proposed rule, conditional on the same leader having both proposed and finalized it (i.e., exploring the subset in which *Execution* equals one).

For each leader we identified their gender, as well as a number of background characteristics,¹¹ including

10 Potter (2019) refers to these scores as relating to a proposed rule's "impact." Specifically, she employs a latent variable approach based on attributes of each proposed rule, including whether the proposal was "economically significant," whether it affected small businesses or other governmental entities, and whether its publication was covered by the *New York Times*. A proposed rule that has broad policy impact and affects many different types of groups has a higher ambition score than a proposed rule has a narrower scope.

11 To identify information about leaders, their dates of service, and their demographic characteristics, we relied on a combination of Internet resources, including www.congress.gov, the Wayback Machine (www.archive.org), LinkedIn, Wikipedia, and www.allgov.com. Nearly all of the leaders in our data set were presidential appointees, although not all posts required Senate confirmation. Because we are unaware of a data source that comprehensively lists all agency leaders and their key characteristics over time, our approach led to some cases of missing data. We discuss missing data in more detail in Section B of [Supplementary Material](#).

9 We identified the bureau by the first four digits of the proposed rule's Regulatory Identification Number (RIN). In some cases, the entity sponsoring the proposed rule was an office (e.g., the Office of the Secretary of Health and Human Services) or a department (e.g., the Department of Veterans Affairs) rather than a bureau per se. For simplicity, we refer to leaders as agency heads throughout the text.

Table 1. Demographic Differences Between Men and Women Agency Leaders

	Men	Women	Difference?
Age ^a	52.95	50.07	-2.88
Minority	0.28	0.30	
Education level ^b	2.33	2.34	
Worked in another department	0.15	0.14	
Prior experience in bureau	0.37	0.36	
Previous public management experience	0.63	0.65	
Senate-confirmed position	0.79	0.83	
Tenure in position ^c	3.37	3.57	
Serving in women's issue area	0.37	0.51	0.14

Note: Table entries are group means. The “Difference” column indicates whether the differences between men and women are statistically significant at the $p < .05$ level. This table shows that there is no statistically discernible difference between men and women in terms of their education level, minority status, position rank (i.e., whether the position required Senate confirmation or not), length of time served, or prior public management experience. Although women leaders do tend to be slightly younger on average than men, the difference is small—about 2 years.

^aLeader's age at the time of appointment.

^bWe code education levels (0–3) as high school, bachelors, masters, and doctorate.

^cCalculated as years served in position.

their age (at the time they took up the position), educational attainment (*Bachelors*, *Masters*, and *PhD*),¹² race, and whether they had prior public management experience.¹³ We also evaluated the length of time (in years) that they served as the agency leader¹⁴ and whether the position required confirmation by the Senate. Our data suggest that although female agency heads are less common than male heads, demographically speaking they are not all that different. As shown in [Table 1](#), there is no statistically discernible difference between men and women in terms of their education level, minority status, position rank (i.e., whether the position required Senate confirmation or not), length of time served, or prior public management experience. Although women leaders do tend to be slightly younger on average than men, the difference is small—about 2 years. [Table 2](#) lists the data sources for the model variables and provides descriptive statistics.

To evaluate our Policy Issues Hypothesis, we coded each agency in terms of whether it dealt with a policy issue where women tend to more actively participate

than men. Specifically, we matched each agency with the Policy Agendas Project major topic area ([Baumgartner and Jones 2016](#)) that most closely characterized its function. Of the 19 Policy Agendas Project issue areas, we then identified agencies that operate in six predominantly women's policy areas as characterized by [Volden, Wiseman, and Wittmer \(2018\)](#). Focusing on policymaking in Congress, these scholars identify women's policy issues endogenously as those areas in which women legislators are significantly more likely to put forward bills than their male peers. The six issue areas are as follows: civil rights and liberties; education; health; housing and community development; labor, employment, and immigration; and law, crime, and family.¹⁵ *Women's Issue* is a dichotomous indicator of whether the agency's substantive policy focus is in a women's policy area or not. As shown in [Figure 1](#), less than a third of all agencies focus on the so-called women's issues.

To evaluate our Supportive Work Environment Hypothesis, we develop a measure of the supportiveness of each agency's work environment in each year. We define a supportive work environment to be one where women have met or exceeded parity with men in terms of status, presence, and compensation; accordingly, our measure takes into account these three factors. *Supportive Environment* is a composite measure, created using principal components analysis, that loads from three measures for each agency in each year.¹⁶ Importantly, while all of the three component measures are correlated with one another (see [Table 3](#)), they each capture distinct aspects of an agency's work environment. First, we capture the proportion of an agency's senior leaders that were women, according to the Office of Personnel Management (OPM). Specifically, we gather data on all bureau employees listed as a “Leader” or “Team Leader” in OPM's FedScope database and then sort leaders by gender. Second, we gather data from this source on women at the rank-and-file level: specifically, we calculate the proportion of the agency's total workforce that is made up of women. Finally, to assess the status that women in the agency have achieved relative to men, we compute the average pay grade differential between professional women and men in an agency in each fiscal year. Specifically, we use OPM's FedScope database to identify the mean GS grade for men working in an agency and then subtract that from the mean GS grade for women working in the agency. Values close to zero thus indicate that women and men have approximately equal ranks within the agency, whereas higher values indicate that women have exceeded the status of men.

¹² High school is the omitted case.

¹³ In choosing which leader attributes to include and how to code them, we largely follow [Lewis's \(2007\)](#) study of the effect of leader attributes on agency performance.

¹⁴ Although these variables are quantified in years, we observe tenure at the month level and therefore include fractions of years in the creation of this variable.

¹⁵ We consider alternate coding schemes in the *Robustness* section.

¹⁶ The eigenvalue of 2.05 suggests that there is indeed one dimension to the data. Additional information about the primary component analysis is provided in Section C of [Supplementary Material](#).

Table 2. Descriptive Statistics and Sources for Model Variables

Variable Name	Mean	SD	Minimum	Maximum
<i>Ambition</i> ^a	0.182	0.107	0.007	1
<i>Execution</i> ^b	0.595	0.491	0	1
<i>Ambitious Execution</i> ^{a,b}	0.179	0.107	0.009	0.961
<i>Female Leader</i> ^c	0.359	0.480	0	1
<i>Women's Issue</i> ^d	0.143	0.350	0	1
<i>Supportive Environment</i> ^e	0.530	0.290	0	1
<i>Age</i> ^e	52.029	8.327	31	74
<i>Minority</i> ^e	0.160	0.366	0	1
<i>Bachelors</i> ^e	0.161	0.368	0	1
<i>Masters</i> ^e	0.324	0.468	0	1
<i>PhD</i> ^e	0.510	0.500	0	1
<i>Worked in Another Department</i> ^e	0.096	0.295	0	1
<i>Prior Experience in Bureau</i> ^e	0.454	0.498	0	1
<i>Previous Public Management Experience</i> ^e	0.621	0.485	0	1
<i>Leader Tenure</i> ^e	2.441	1.891	0	16.667
<i>Senate-Confirmed Position</i> ^f	0.886	0.318	0	1

Source: ^aPotter (2019).

^bUnified Agenda.

^cSee Section B in [Supplementary Material](#).

^dAuthors' coding based on Policy Agendas Project and [Volden, Wiseman, and Wittmer \(2018\)](#).

^eAuthors' analysis of FedScope data.

^fLibrary of Congress.

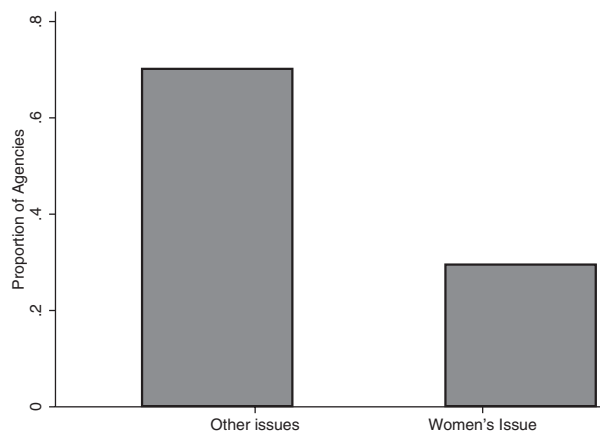


Figure 1. Distribution of Women's Issue Agencies. *Note:* Figure shows the distribution of the *Women's Issue* among agencies in the data set. This variable is coded at the agency level according to the method laid out in Section A of [Supplementary Material](#).

The resulting *Supportive Environment* measure factors in each of these three components. It is normalized between zero and one, with higher values indicating a more supportive work environment. [Figure 2](#) shows the distribution of *Supportive Environment*, illustrating that agencies range considerably in the supportiveness of their workplaces. The EPA, mentioned earlier as an agency that is fairly supportive of women, scores above the average (EPA mean = 0.62). Other agencies add to the face validity of the measure; the Mine Safety and Health Administration has the lowest average score

(MSHA mean = 0.05), whereas the Health Resources and Services Administration has the highest score (mean HRSA score = 0.93).

Finally, as an additional agency-level control, we account for agency “types” following [Lowi's \(1972\)](#) four categories—constituent, distributive, redistributive, and regulatory—based on the agency's mission and the type of work it conducts. Prior work has shown that women's leadership differs across agency type in meaningful ways ([Dolan 2004](#); [Newman 1994](#); [Sabharwal 2015](#); [Sneed 2007](#)), although there is no consensus about where women should be expected to excel.¹⁷

Results

[Table 4](#) presents tests of the *Gendered Rulemaking Hypothesis*. Table entries are ordinary least squares

¹⁷ The findings on gender and agency type are decidedly mixed. For instance, [Dolan \(2004\)](#) finds that distributive agencies are particularly conducive to women's leadership. Meanwhile, [Sabharwal \(2015\)](#) finds that women in distributive agencies are the most likely to face a precarious “glass cliff,” but are least likely to do so in redistributive agencies. However, [Sneed \(2007\)](#) finds that women in the redistributive agencies face the highest gender wage gap. See Section A of [Supplementary Material](#) for an explanation of how the agencies were classified according to Lowi's typology. [Supplementary Table D22](#) shows the impact of female leadership in each agency type and provides a preliminary indication that women's rulemaking performance may be somewhat enhanced in redistributive agencies.

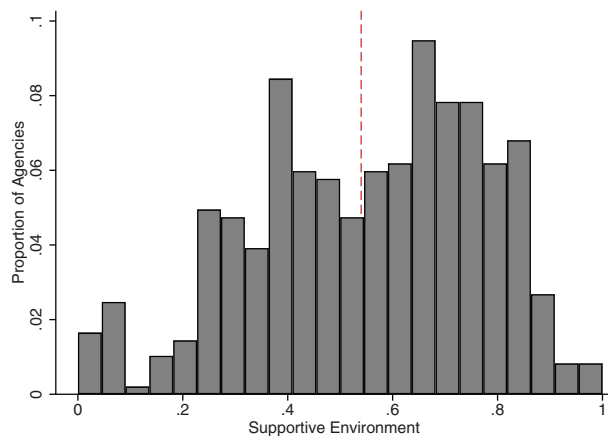


Figure 2. Distribution of Supportive Environment across Agencies. *Note:* The figure shows the distribution of *Supportive Environment* among agency-years in the data set. This composite measure draws from three distinct aspects of an agency's work environment: (1) the proportion of the agency's leaders or team leaders who are women; (2) the proportion of women that constitute the agency's workforce; and (3) the grade differential between the mean General Schedule (GS) grade for women in the agency and men in the agency. *Supportive Environment* is normalized to range between 0 and 1, with higher values indicating a workplace that is more supportive of women. The dashed line indicates the mean value.

coefficients,¹⁸ with fixed effects to account for the year in which a rule was proposed. We employ random effects at the agency level in order to account for unobserved agency-level variance and include fixed effects by agency type (Lowi 1972). All standard errors are clustered at the agency level.

Contrary to the hypothesized relationship, across all three dependent variables, female leaders are not associated with an increase in an agency's rulemaking performance.¹⁹ Indeed, the *Female Leader* coefficient is negatively signed, suggesting that women may perform worse than their male peers. However, this result is not statistically significant in any of the three models. Looking across the control variables in the models, leader characteristics have little systematic effect on the impact of regulations put forth by bureaus. The lone exception is that having previous public management experience is associated with a statistically significant *decrease* in rulemaking ambition in Models 4.1 (albeit at the $p < .10$ level) and 4.3.

18 One of our dependent variables, *Execution*, is a dichotomous measure of whether leaders were able to finalize the same rules they proposed. Due to the ease of interpretability, we present linear probability models for this variable. The results are unaffected both in substance and statistical significance by using a logit specification; see [Supplementary Table D17](#).

19 There are fewer observations included in the *Execution* models than the *Ambition* models. This is because we omit rules that were merged with or transferred to another RIN during the course of our study. Additionally, we assume that rules that were censored (i.e., not finalized during the period under our study) were not finalized during the leader in question's tenure (i.e., had a value of zero). Relaxing this assumption does not affect the substantive interpretation of our results; see [Supplementary Table D16](#).

Table 3. Correlation Matrix for Feminine Agency Work Context Variables

	Women's Issue	Women Leaders	Women Workforce	Grade Differential
<i>Women's Issue</i>	1.0000			
<i>Women Leaders</i>	0.2115	1.0000		
<i>Women Workforce</i>	0.2283	0.6119	1.0000	
<i>Grade Differential</i>	0.1905	0.2555	0.3570	1.0000

Note: This table shows the correlations between each of the four agency feminine context indicators. It demonstrates that although these variables are indeed correlated with one another, they nonetheless capture distinct aspects of an agency's work environment.

The tests of [Table 4](#), however, do not take into account the possibility of a *conditional* effect of female leadership. The models in [Table 5](#) collectively test the *Policy Issues Hypothesis*; specifically, we interact our *Women's Issue* measure with the indicator of whether or not the agency's leader was a woman. All other model specifications follow those in [Table 4](#).

A consistent story emerges from these models; in agencies that focus on women's issues, female leaders oversee the production of rules that are more ambitious (Model 5.1) and execute the finalization of rules at a greater rate (Model 5.2). And among the rules that are finalized, women leaders tend to prioritize the most ambitious ones in women's issues agencies (Model 5.3). Looking at Model 5.1, compared to a male working in a women's issue agency a female leader is expected to produce a rule that scores 0.02 higher on the *Ambition* score, which represents about 20% of 1 SD in that measure. The results for *Execution* in Model 5.2 suggest an increase in finalization of approximately 0.15. This is an increase of 15 percentage points in rules being finalized, a substantial boost over the average 60% finalization rate. And in Model 5.3, compared with a man leading a women's issue area agency, having a female leader is associated with a 0.02 increase on the *Ambition* score among the proposed rules that are finalized (although this effect is significant only at the $p < .11$ level).

The *Supportive Environment Hypothesis* is evaluated in [Table 6](#)²⁰; the hypothesis is broadly supported across the three models. As shown in Model 6.1, women leaders in work environments that are supportive of women propose more ambitious rules. A woman leading an agency with an unsupportive work environment, like the Federal Aviation Administration (FAA) in 2004 (*Supportive Environment* = 0), is predicted to

20 For privacy reasons, OPM does not report data on small cells of employees. This restriction reduces the sample size for models that rely on the OPM data. Additionally, it was not possible to map personnel data to some of the smaller bureaus and offices included in the dataset, which again reduces the sample size for models relying on these data.

Table 4. Effects of Female Leadership on Agency Rulemaking

	(4.1)	(4.2)	(4.3)
	Ambition	Execution	Ambitious Execution
<i>Female Leader</i>	-0.002 (0.663)	-0.015 (0.699)	-0.002 (0.708)
Age	0.00004 (0.895)	0.0004 (0.835)	0.0003 (0.455)
Minority	-0.007 (0.262)	-0.032 (0.218)	-0.003 (0.736)
Bachelors	0.030 (0.309)	-0.195 (0.059)	0.006 (0.822)
Masters	0.028 (0.346)	-0.077 (0.444)	0.022 (0.431)
PhD	0.036 (0.225)	-0.100 (0.329)	0.027 (0.325)
Worked in Another Department	0.014 (0.202)	0.044 (0.491)	0.026 (0.071)
Bureau Experience	-0.002 (0.747)	0.084 (0.183)	0.013 (0.258)
Previous Public Mgmt Experience	-0.015 (0.082)	-0.064 (0.321)	-0.036 (0.009)
Leader Tenure	-0.00007 (0.972)	-0.099 (0.000)	0.001 (0.549)
Leader Tenure ²	-0.0001 (0.699)	0.006 (0.000)	-0.0003 (0.080)
Senate-Confirmed Position	0.006 (0.562)	-0.081 (0.076)	-0.004 (0.729)
Rule Ambition		-0.022 (0.821)	
Constant	0.116 (0.002)	1.087 (0.000)	0.109 (0.005)
Observations	8,541	8,338	4,964
Agency RE	YES	YES	YES
Agency Type FE	YES	YES	YES
Year FE	YES	YES	YES

Note: Coefficients from ordinary least squares models with *p*-values in parentheses. Standard two-tailed cutoff levels establish statistical significance. All models include robust standard errors clustered on the agency.

propose a rule that is -0.05 less ambitious (i.e., one half of a standard deviation in the *Ambition* scale) than a man leading the same agency. In contrast, at the most supportive agency—the National Science Foundation (NSF) in 2008 (*Supportive Environment* = 1)—a female leader is expected to surpass a male leader's ambition by proposing a rule that is 0.04 more ambitious.

For *Execution* (Model 6.2), the results are starker, although the interaction coefficient is significant only at the $p < .10$ level. In the case of the FAA, a female leader is 29 percentage points less likely to finalize a proposed rule than a male leader. On the other end of the spectrum, a female leader at the NSF is 24 percentage points more likely to

finalize a proposed rule. Across the full spectrum of *Supportive Environment*, this is a major swing—a 53 percentage-point increase in the likelihood of finalization, more than doubling the likelihood of finalization. Finally, in Model 6.3, the results for *Ambitious Execution* combine these two findings, showing that in supportive work environments, among the rules they finalize female leaders prioritize the most ambitious ones. At the FAA, this translates to a decrease of -0.04 for a female leader in terms of *Ambitious Execution*, whereas at the NSF, a female leader is expected to finalize a proposed rule that is 0.04 higher in terms of *Ambitious Execution*. Again, this represents a large swing of nearly 1 SD moving from the agency that is least supportive of women to the one that is the most.

Plotting the marginal effects from Table 6, as we do in Figure 3, provides a more nuanced understanding of the takeaways from these models. Most notably, it is clear across all three metrics that female leaders underperform male ones in agencies that are highly unsupportive of women. Conversely, in agencies that have the highest levels of supportiveness, women's leadership appears to exceed that of men's, but in no case is this effect statistically significant with a 95% confidence interval (despite the highly significant positive slopes). Interestingly, at the mean level of supportiveness (*Supportive Environment* = 0.5) in all three instances the marginal effect is approximately zero, suggesting no difference between men and women's leadership.

Stepping back, these results suggest that women may outperform men in rulemaking in certain contexts. Although we find no evidence that women are any better (or any worse) than men in general, in agencies that focus on women's policy issues and in agencies that have a work environment that is broadly more supportive of women, women leaders excel at proposing ambitious rules, finalizing rules, and finalizing ambitious rules. In fact, in these environments, men may even face a disadvantage. However, with respect to places where men exceed women's performance, we find that women underperform in unsupportive work environments. In the context of agencies that focus on other issues (i.e., not women's issues), we find no significant differences between male and female leaders.

Robustness

In order to probe the robustness of these results, we now consider a variety of potential threats to our interpretations. To begin, we acknowledge that scholars frequently disagree about which issues constitute

Table 5. Effects of Female Leadership on Rulemaking in Women’s Issue Areas

	(5.1)	(5.2)	(5.3)
	Ambition	Execution	Ambitious Execution
Female Leader	-0.007 (0.136)	-0.050 (0.266)	-0.006 (0.270)
Women’s Issue	-0.013 (0.324)	-0.057 (0.273)	-0.012 (0.411)
<i>Female Leader × Women’s Issue</i>	<i>0.030</i> <i>(0.021)</i>	<i>0.198</i> <i>(0.005)</i>	<i>0.025</i> <i>(0.104)</i>
Observations	8,541	8,338	4,964
Controls	YES	YES	YES
Agency RE	YES	YES	YES
Agency Type FE	YES	YES	YES
Year FE	YES	YES	YES

Note: Coefficients from ordinary least squares models with *p*-values in parentheses. Standard two-tailed cutoff levels establish statistical significance. All models include robust standard errors clustered on the agency. All control variables from Table 4 are included. Full models with control variables are presented in Supplementary Table D1.

Table 6. Effects of Female Leadership on Rulemaking in Supportive Work Environments

	(6.1)	(6.2)	(6.3)
	Ambition	Execution	Ambitious Execution
Female Leader	-0.049 (0.018)	-0.285 (0.086)	-0.044 (0.052)
Supportive Environment	0.004 (0.906)	-0.190 (0.372)	0.033 (0.458)
<i>Female Leader × Supportive Environment</i>	<i>0.085</i> <i>(0.033)</i>	<i>0.529</i> <i>(0.066)</i>	<i>0.079</i> <i>(0.049)</i>
Observations	4,754	4,652	2,759
Controls	YES	YES	YES
Agency RE	YES	YES	YES
Agency Type FE	YES	YES	YES
Year FE	YES	YES	YES

Note: Coefficients from ordinary least squares models with *p*-values in parentheses. Standard two-tailed cutoff levels establish statistical significance. All models include robust standard errors clustered on the agency. Full models with control variables are presented in Supplementary Table D2.

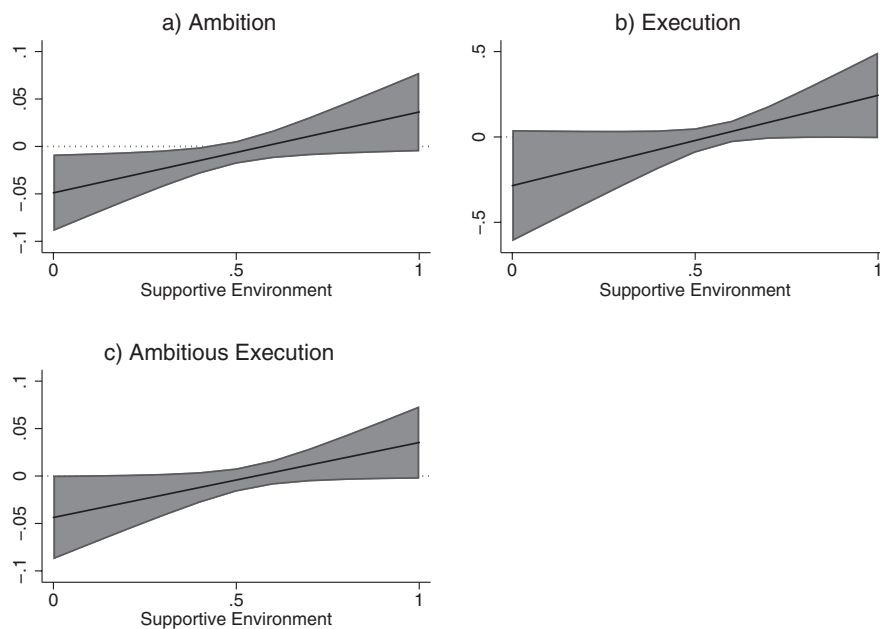


Figure 3. Marginal Effects of Female Leadership on Rulemaking in Supportive Work Environments. Note: Figures show the marginal effect of having a female agency leader (compared with a male leader) across different levels of supportive work environments for each of the three dependent variables. All other variables are held constant at their mean values. The results show that when women lead agencies that are supportive of women, they produce more ambitious rules and finalize them at a greater rate.

women’s issues. The approach we take, which builds off of Volden, Wiseman, and Wittmer’s (2018) coding, has two major benefits. First, it allows women in a different context (Congress) to determine which issues are the most important to them. Second, when we bring this schematic to the bureaucracy, we are able

to code women’s issue at the bureau, rather than the department, level.

Nonetheless, many scholars apply a more deductive approach to studying women’s issues, preferring to *ex ante* identify a set of policy areas that are considered by the literature and tradition to be women’s issues. Krook

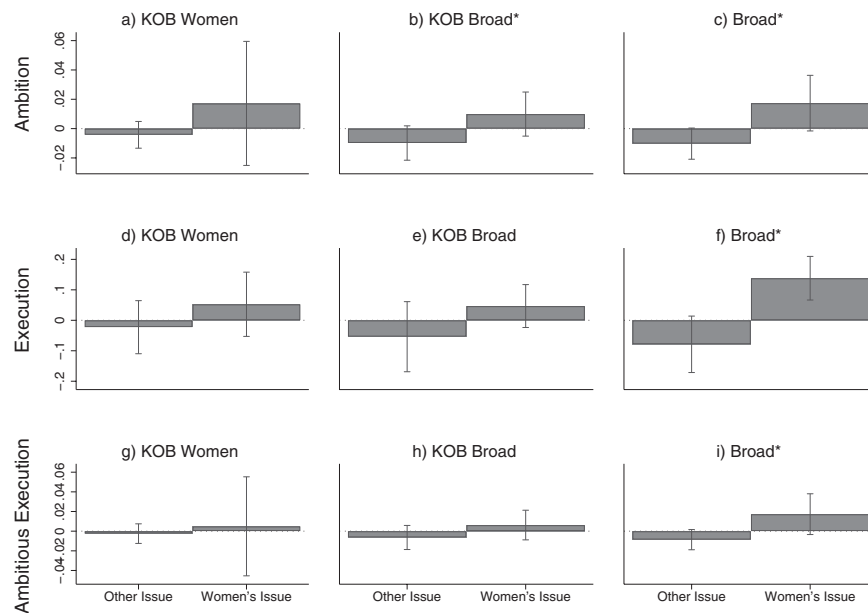


Figure 4. Marginal Effects of Female Leadership on Rulemaking in Women's Issue Areas. *Note:* Figures show the marginal effect of having a female agency leader (compared with a male leader) in a women's issue area for each of the three dependent variables. All other variables held constant at their mean values. The asterisks indicate a statistically significant relationship ($p < .05$). The first column shows the results for feminine agency only following Krook and O'Brien's coding (KOB); for full results, see [Supplementary Table D3](#). The second column shows the results for both feminine and neutral agencies under KOB ([Supplementary Table D4](#)). The third column shows the results for a broader interpretation of our coding scheme, based on eight issue areas ([Supplementary Table D5](#)). In total, the results show that when women lead agencies that focus on women's issue areas, they produce more ambitious rules and finalize them at a greater rate; however, these relationships are more meaningfully delineated when women's issues are more broadly defined.

and O'Brien (2012) do just this and identify which bureaucratic departments are considered feminine, as opposed to masculine or neutral. As a robustness check, we use their coding schematic, resulting in a department level (i.e., not bureau level) categorization for each agency as either feminine, masculine, or neutral.²¹

We then rerun the analyses in [Table 5](#), presenting the results in [Figure 4](#). The first column shows the effect of a woman leader leading a feminine agency—as determined by Krook and O'Brien (2012)—for each of our three outcome measures. The middle column shows the effect of a woman leader leading a feminine or a neutral agency (i.e., not a masculine agency), following the same coding. Finally, the third column shows the effect of a woman leader leading a women's issue agency, following a broader characterization of our original coding scheme.²²

Substantively, the results in [Figure 4](#) suggest that there is an effect of women's leadership in agencies that

focus on women's issues, but that it is more starkly defined in broader categorizations of what constitutes a women's issue. Looking across all three coding schemes and all three dependent variables, women tend to outperform men in women's issue agencies, and underperform them in agencies that focus on other issues.

Next we consider the fact that our *Supportive Environment* measure is a composite of three separate components: the proportion of the agency's leaders who are women, the proportion of the agency's workforce made up of women, and the grade differential between women and men in the agency. We believe an index approach is appropriate because all of these aspects of an agency are jointly experienced by the leader; nonetheless in [Figure 5](#), we disaggregate the results for each component in order to ensure no one aspect of the index is driving the earlier results.

[Figure 5](#) shows that for each of the three component measures, there is a positive relationship between the supportiveness of the agency and the likely success of a female leader in terms of rule ambition, rule execution, or ambitious rule execution. On the whole, the positive relationships across all nine analyses advance the *Supportive Work Environment Hypothesis*, despite attaining statistical significance in only five of the nine cases. The directional consistency of the effects shows that no single aspect is underlying the earlier composite *Supportive Environment* results.

21 See Section B of [Supplementary Material](#) for more information on the classification system.

22 Specifically, although Volden, Wiseman, and Wittmer (2018) classify six policy areas as women's issues, they suggest an additional two—environment and social welfare issues—that might also be considered women's issues based on their review of the literature on women's policy issues. Although the earlier results relied on the more conservative six, the coding in the third column of the figure classifies all eight as women's issues.

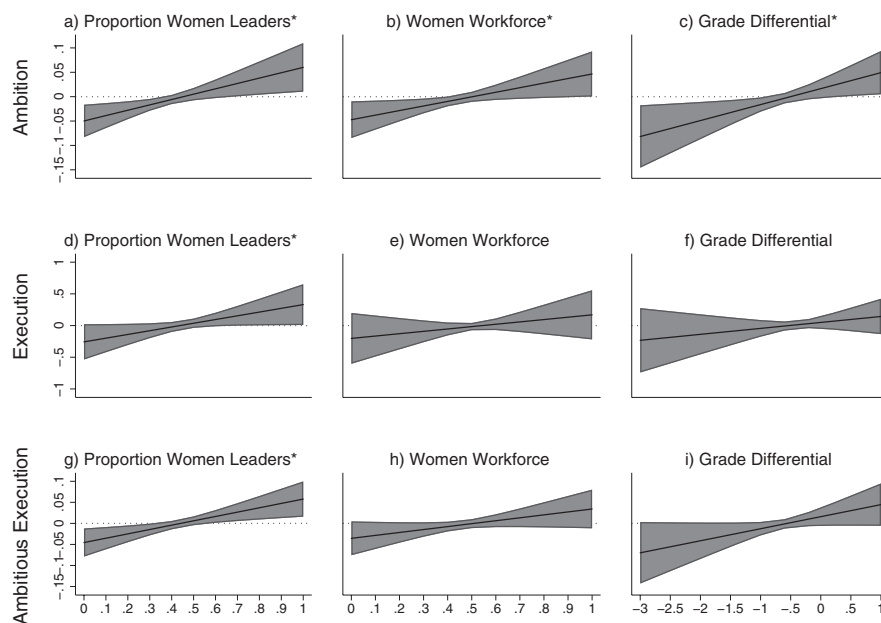


Figure 5. Marginal Effects of Female Leadership on Rulemaking in Supportive Work Environment Components. *Note:* Figures show the marginal effect of having a female agency leader (compared with a male leader) in a work environment for each of the three dependent variables. The first column shows the effect of a female leader conditioned on the proportion of women leaders in the agency; see [Supplementary Table D6](#) for full model results. The second column shows the results conditioned on the proportion of women in the agency's workforce ([Supplementary Table D7](#)). The third column shows the results conditioned on the grade differential ([Supplementary Table D8](#)). All other variables held constant at their mean values. The results show that across all three measures, women leaders are more ambitious and more successful in rulemaking when the agency is more supportive of women.

We next consider whether leaders are more empowered to do rulemaking under certain presidential administrations. Although both Democratic and Republican administrations use rulemaking to pursue their regulatory policy agendas, the tool is often more closely associated with the former than the latter.²³ In order to evaluate whether the results rely more heavily on Democratic administrations, we split the sample into Democrat (Bill Clinton and Barack Obama) and Republican (George W. Bush) administrations. We show the results for women's issues ([Supplementary Table D9](#)) and supportive environments ([Supplementary Table D10](#)) in [Supplementary Material](#); across 11 of the 12 models, the interactions on female leader retain their expected positive sign, although in all but two cases the coefficients lose statistical significance—a result that may owe to the reduced sample sizes. Across both Democratic and Republican administrations, however, the effect sizes appear quite similar.

The results we present are robust to a number of additional analyses and specifications, which we report in

²³ Notably, our measures do not focus on the *volume* of rulemaking, but rather the overall importance of a rule and whether it is completed. These measures are useful even if a presidential administration were to advance an explicitly deregulatory agenda, which would require agencies to propose and finalize new rules in order to roll back existing regulations. Our measures would capture this effort.

[Supplementary Material](#). First, we split the sample according to whether the agency is in ideological alignment with the president using a measure developed by [Clinton and Lewis \(2008\)](#); an agency that is not supported by the president may be less able to accomplish regulatory objectives. The results for women's issues and for supportive environment are presented in [Supplementary Tables D11 and D12](#), respectively, and offer some evidence (albeit weak) that presidential support may be a mitigating factor. Next, in [Supplementary Tables D13 and D14](#), we break the results apart for leaders who are Senate confirmed and those who are not. Additionally, we consider an alternate measure of a rule's importance in lieu of our *Ambition* measure ([Supplementary Table D15](#)); *Priority* is a discrete measure of a rule's importance as self-reported by the agency in the *Unified Agenda*. In [Supplementary Table D16](#), we omit rules that were not finalized during the study's time period from our coding of rules in the *Execution* models, and in [Supplementary Table D17](#), we rerun our *Execution* models using a logistic approach. In [Supplementary Tables D18 and D19](#), we consider a multi-level modeling structure that accounts for the nesting of bureaus within departments. Finally, [Lewis \(2007\)](#) suggests a number of agency-level covariates that can potentially affect an organization's performance; we include these variables in [Supplementary Tables D20 and D21](#).

In total, across [Supplementary Tables D3–D21](#), for 36 robustness check models for the *Policy Issues Hypothesis*,

35 interaction coefficients for female leader are signed as predicted and 14 are statistically significant at the $p < .05$ or $p < .10$ levels. For the *Supportive Work Environment Hypothesis*, out of a total of 36 robustness checks, 33 interaction coefficients are appropriately signed and 16 are statistically significant (at the $p < .05$ or $p < .10$ levels) in the expected direction. On the whole, across the analyses of the ambition of rules, the execution of rules, and the ambitious execution of rules, consistent evidence emerges that there is a *conditional* policy premium associated with women's leadership.

Discussion: Potential Mechanisms and Future Directions

Overall, the results of our analysis demonstrate that there is a *conditional* policy premium to women's leadership of federal agencies: women are associated with increased rulemaking performance when they lead agencies that focus on women's policy issues (broadly defined) and when the working environment of the agency is supportive of women. It is worth noting that these are correlational relationships²⁴ and that there are a variety of potential mechanisms that could give rise to them in a causal sense. We describe several of these potential theoretical mechanisms here; while parsing them is beyond the scope of this article, we strongly encourage future work that takes up this agenda.

First, the policy premium may arise in a top-down manner from the leader herself. In a women's policy issue area, a leader may feel particularly empowered, either through her own personal experience with the issue or given the historical authority that women have traditionally experienced in these areas. Similarly, and drawing from the logic of "critical mass theory" (Kanter 1977; Kenney 1996) when a female leader heads an organization that is more supportive of women, she may be freed up to select from a broader menu of leadership styles and may choose a style that is conducive to greater rulemaking performance.

An alternate, bottom-up mechanism is that the subordinates working underneath a female leader in these contexts may feel inspired and augment their performance in response. For instance, in an agency focused on women's policy issues, employees may perceive a female agency head to be uniquely qualified to advance the agency's agenda, irrespective of whether the agency head is indeed specially qualified. Likewise, in an agency where women have achieved status parity

with men, the workforce may perceive a female leader to understand the challenges and opportunities the agency faces, again separate from the agency head's actual qualifications.

Beyond the leader and her subordinates, there are other potential mechanisms that could be at work. For example, following the logic of the "glass cliff," female leaders could be selected to lead agencies with the expectation of failure (Sabharwal 2015). As Ryan and Haslam (2005) explain, the glass cliff is when women are "preferentially placed in leadership roles that are associated with an increased risk of negative consequences" (83). In the present context, the glass cliff could explain our results if women leaders were disproportionately selected to lead agencies that are not focused on women's policy issues or that are less supportive of women precisely at the times when these organizations are in crisis or when the agencies are not primed to succeed in rulemaking.

It is worth noting that these mechanisms are not mutually exclusive; it is possible for many of them to operate at once. Ultimately, we believe that it is likely that several of these mechanisms—and possibly more that we have not addressed directly here—underlie the topline findings we have presented.

Although we believe that the bulk of the work ahead for future researchers lies in untangling the mechanisms outlined above, our findings merit further investigation on four additional dimensions. First, we believe that there are additional consequences associated with female leadership of bureaucratic agencies. For instance, in other contexts, female leaders are known to "pay it forward" by promoting more junior women into positions of power (Gorman 2005). In the regulatory context, this suggests additional downstream implications in terms of the roles that women take on in rule-writing. Second, we have classified the gendered policy context at the *agency level* rather than the *rule level*. Although we believe that this is a reasonable approach to understanding the general substance of policymaking, further work diving into the direction and substance of individual rules would certainly be valuable (see, e.g., Workman 2015). Third, our work has focused on gender, but there are other features of descriptive representation, such as race and prior service in the military, that may condition a leader's success and are certainly worthy of study. Fourth, the role of presidential support for an agency is likely to play an important mitigating role; our robustness check on this dimension is intriguing and worthy of future research.

Conclusion

When a president selects a male-dominated Cabinet and bureaucratic leadership team—as President Trump

24 The nature of our data makes pinning down causality a particularly precarious exercise. Female leaders choose whether to work in women's policy areas or in other policy areas. This form of selection is certainly not random and there may be (likely unobservable) differences between women who pursue leadership roles in feminine policy and work contexts and those who do not.

did after assuming office—it introduces obvious issues in terms of the overall representativeness of the bureaucracy. Our results suggest that such a choice may also have implications for the *performance* of bureaucratic agencies. When women are given a chance to lead agencies that have a supportive work environment for women, they are more successful at introducing and advancing important regulations through the notice-and-comment rulemaking process. Conversely, our results suggest that male leaders exceed female leaders in working environments that are less supportive of women. Our findings on women leaders working on women's issues are more mixed: if what counts as a women's issue is broadly construed, then women may be more successful at rulemaking. However, under a narrower conception of the term, this result is more tentative.

These findings have immediate theoretical and practical implications. "Glass walls" are often singled out for their normatively troubling aspects (e.g., Sneed 2007). By cordoning women into certain professional areas (e.g., Davis 1997; Escobar-Lemmon and Taylor-Robinson 2009; Krook and O'Brien 2012; Reynolds 1999; Studlar and Moncrief 1999), glass walls prevent the free movement of talent and are often thought to be inefficient. Our results suggest that there may actually be some efficiency gains associated with "glass walls," because female leaders may exceed male leaders in some of these issue areas. However, the fact that women's issue agencies tend to offer women more supportive environments, combined with some uncertainty surrounding what even counts as a women's issue, suggests that scholars may be focusing on the wrong theoretical concept.

Retaining or thickening glass walls remains normatively unappealing, and tearing them down (e.g., changing societal conceptions of what constitutes "women's issues") is difficult to accomplish. However, our findings on work environments that are supportive of women offer an ingress into a more attractive and feasible approach to enhancing women's representation and the effectiveness of women's leadership. Simply put, our research suggests a direct way to augment the effectiveness of women's leadership in the bureaucracy is to change the level of support for women across bureaucratic workplaces. Concrete steps include increasing the number of women in the workforce, increasing the number of women in leadership positions, and decreasing the pay gap between men and women in the agency. Efforts might include the adoption of targeted recruitment policies or the expansion of family-friendly policies (Sneed 2007).

This study focuses on women's leadership in the rulemaking arena, but it has natural parallels to other areas of representation. For instance, a supportive working environment may enhance the effectiveness of not just the agency's female leader, but also the efficacy

of its staff. Although we believe that our findings also likely apply to other levels of government (e.g., state or local bureaucratic agencies), we are hesitant to extend them to other institutional settings such as legislatures because specific features of the institutional context may play additional important mediating roles.

Finally, our findings also speak to the role of men as agency leaders. Our results suggest that men may be at a disadvantage in leading agencies that focus exclusively on women's issues or that are highly supportive of women. Conversely, men may enjoy something of a leadership policy premium in work environments that are highly unsupportive of women. The implication here is that changing the agency culture in an unsupportive agency will require buy-in from men, who may perceive a change to the status quo (in which they are thriving) as a threat to their ability to lead; on this count, it is important to note that our results show that supportiveness serves to level the playing field on the whole, rather than to stack it against men.

Supplementary Material

Supplementary data are available at the *Journal of Public Administration Research and Theory* online.

Acknowledgments

For helpful feedback, we thank Dan Carpenter, George Krause, Jennifer Lawless, Kira Sanbonmatsu, Michele Swers, Alan Wiseman, and Dana Wittmer Wolfe, as well as seminar participants at the University of North Carolina at Chapel Hill, the Center for the Study of Democratic Politics at Princeton University, and attendees of the New Developments in the Study of Presidential and Executive Politics conference at Vanderbilt University. We thank Alina Dunlap, Gavin Riley, and Aita Seck for research assistance. Potter thanks the Center for the Study of Democratic Politics at Princeton University for research support.

Data Availability

The data underlying this article will be shared on request to the corresponding author.

References

- Andreoni, James, and Lise Vesterlund. 2001. Which is the fair sex? Gender differences in altruism. *Quarterly Journal of Economics* 116 (1):293–312.
- Anzia, Sarah F., and Christopher R. Berry. 2011. The Jackie (and Jill) Robinson effect: Why do congresswomen outperform congressmen? *American Journal of Political Science* 55 (3):478–93.
- Banaszak, Lee Ann. 2010. *The women's movement inside and outside the state*. Cambridge: Cambridge Univ. Press.
- Barnes, Tiffany D. 2016. *Gendering legislative behavior*. New York, NY: Cambridge Univ. Press.
- Barnes, Tiffany D., and Diana Z. O'Brien. 2018. Defending the realm: The appointment of female defense ministers worldwide. *American Journal of Political Science* 62 (2):355–68.
- Baumgartner, Frank R., and Bryan D. Jones. 2016. *Policy agendas project*. NSF #SBR 9320922, #0111611, Austin, TX: Univ. of Texas.

- Burford, Anne McGill, and John Greenya. 1986. *Are you tough enough?* New York, NY: McGraw-Hill.
- Carey, Amanda. 2011. EPA administrator Lisa Jackson's journey as a regulatory warrior. *Daily Caller*, February 8. <http://dailycaller.com/2011/02/08/epa-administrator-lisa-jacksons-journey-as-a-regulatory-warrior/>.
- Carpenter, Daniel P. 2001. *The forging of bureaucratic autonomy: Reputations, networks, and policy innovation in executive agencies, 1862–1928*. Princeton, NJ: Princeton Univ. Press.
- Childers, Andrew. 2012. Jackson to step down from agency; legacy includes first greenhouse gas rules. *Bloomberg News*, December 28. <https://www.bna.com/jackson-step-down-n17179871605/>.
- Clinton, Joshua D., and David E. Lewis. 2008. Expert opinion, agency characteristics, and agency preferences. *Political Analysis* 16 (1):3–20.
- Davis, Rebecca Howard. 1997. *Women and power in parliamentary democracies: Cabinet appointments in western Europe, 1968–1992*. Lincoln: Univ. of Nebraska Press.
- Dittmar, Kelly, Kira Sanbonmatsu, Susan J. Carroll, Debbie Walsh, and Catherine Wineinger. 2017. *Representation matters: Women in the U.S. congress*. New Brunswick, NJ: Center for American Women and Politics, Eagleton Institute of Politics, Rutgers, The State Univ. of New Jersey.
- Dolan, Julie. 2000. The senior executive service: Gender, attitudes, and representative bureaucracy. *Journal of Public Administration Research and Theory* 10 (3):513–30.
- Dolan, Julie. 2001. Political appointees in the United States: Does gender make a difference? *Political Science & Politics* 34 (2):213–16.
- Dolan, Julie. 2002. Representative bureaucracy in the federal executive: Gender and spending priorities. *Journal of Public Administration Research and Theory* 12 (3):353–75.
- Dolan, Julie. 2004. Gender equity: Illusion or reality for women in the federal executive service? *Public Administration Review* 64 (3):299–308.
- Draganova, Maria. 2018. Women working for women: Career advancement and the gender wage gap in the U.S. federal government. Working Paper, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3074466.
- Duerst-Lahti, Georgia. 2002. Knowing congress as a gendered institution: Manliness and the implications of women in congress. In *Women transforming congress*, ed. Cindy Rosenthal, 22–49. Norman, OK: Univ. of Oklahoma Press.
- Duhigg, Charles. 2017. For trump's nominees, a billionaires' guide to running the government. *New York Times*, January 19. https://www.nytimes.com/2017/01/19/business/donald-trump-billionaires-cabinet-nominees.html?hp&action=click&pgtype=Homepage&clickSource=story-heading&module=b-led-package-region®ion=top-news&WT.nav=top-news&_r=0.
- Eagly, Alice H., and Mary C. Johannesen-Schmidt. 2001. The leadership styles of women and men. *Journal of Social Issues* 57 (4):781–97.
- Eagly, Alice H., and Blair T. Johnson. 1990. Gender and leadership style: A meta-analysis. *Psychological Bulletin* 108 (2):233–56.
- Escobar-Lemmon, Maria, and Michelle Taylor-Robinson. 2009. Getting to the top: Career paths of women in Latin American Cabinets. *Political Research Quarterly* 62 (4):685–99.
- Flabbi, Luca, Mario Macis, Andrea Moro, and Fabiano Schivardi. 2019. Do female executives make a difference? The impact of female leadership on gender gaps and firm performance. *The Economic Journal* 129 (622):2390–423.
- Funk, Kendall D., Thiago Silva, and Maria C. Escobar-Lemmon. 2019. Leading toward equality: The effect of women mayors on gender equality in local bureaucracies. *Politics, Groups, and Identities* 7 (3):554–73.
- Gardiner, Maria, and Marika Tiggemann. 1999. Gender differences in leadership style, job stress and mental health in male- and female-dominated industries. *Journal of Occupational and Organizational Psychology* 72 (3):301–15.
- Gorman, Elizabeth H. 2005. Gender stereotypes, same-gender preferences, and organizational variation in the hiring of women: Evidence from law firms. *American Sociological Review* 70 (4):702–28.
- Holman, Mirya R., and Anna Mahoney. 2018. Stop, collaborate, and listen: Women's collaboration in US state legislatures. *Legislative Studies Quarterly* 43 (2):179–206.
- Johansen, Morgen S. 2007. The effect of female strategic managers on organizational performance. *Public Organization Review* 7 (3):269–79.
- Kanter, Rosabeth Moss. 1977. *Men and women of the corporation*. New York, NY: Basic Books.
- Karpowitz, Christopher F., and Tali Mendelberg. 2014. *The silent sex: Gender, deliberation, and institutions*. Princeton, NJ: Princeton Univ. Press.
- Kathlene, Lyn. 1994. Power and influence in state legislative policymaking: The interaction of gender and position in committee hearing debates. *American Political Science Review* 88 (3):560–76.
- Keiser, Lael R., Vicky M. Wilkins, Kenneth J. Meier, and Catherine A. Holland. 2002. Lipstick and logarithms: Gender, institutional context, and representative bureaucracy. *American Political Science Review* 96 (3):553–64.
- Kenney, Sally J. 1996. New research on gendered political institutions. *Political Research Quarterly* 49 (2):445–66.
- Krook, Mona Lena, and Diana Z. O'Brien. 2012. All the President's Men? The appointment of female cabinet ministers worldwide. *Journal of Politics* 74 (3):840–55.
- Lawless, Jennifer L. 2015. Female candidates and legislators. *Annual Review of Political Science* 18:349–66.
- Lawless, Jennifer L., Sean M. Theriault, and Samantha Guthrie. 2018. Nice girls? Sex, collegiality, and bipartisan cooperation in the US congress. *Journal of Politics* 80 (4):1268–82.
- Lee, Jasmine C. 2017. Trump's cabinet so far is more white and male than any first cabinet since Reagan's. *New York Times*, January 13. <https://www.nytimes.com/interactive/2017/01/13/us/politics/trump-cabinet-women-minorities.html>
- Lewis, David E. 2007. Testing Pendleton's premise: Do political appointees make worse bureaucrats? *Journal of Politics* 69 (4):1073–088.
- Lewis, Michael. 2018. *The fifth risk*. New York, NY: WW Norton & Company.
- Little, Thomas H., Dana Dunn, and Rebecca E. Deen. 2001. A view from the top: Gender differences in legislative priorities among state legislative leaders. *Women & Politics* 22 (4):29–50.
- Liu, Shan-Jan Sarah, and Lee Ann Banaszak. 2017. Do government positions held by women matter? A cross-national examination of female ministers' impacts on women's political participation. *Politics & Gender* 13 (1):132–62.
- Lowi, Theodore J. 1972. Four systems of policy, politics, and choice. *Public Administration Review* 32 (4):298–310.
- Meier, Kenneth J., Laurence J. O'Toole Jr., and Holly T. Goerdel. 2006. Management activity and program performance: Gender as management capital. *Public Administration Review* 66 (1):24–36.
- Newman, Meredith Ann. 1994. Gender and Lowi's thesis: Implications for career advancement. *Public Administration Review* 54 (3): 277–84.
- Niskanen, William A. 1971. *Bureaucracy and representative government*. Chicago, IL: Aldine-Atherton.
- Nou, Jennifer. 2015. Intra-agency coordination. *Harvard Law Review* 129:421–90.
- O'Connell, Anne Joseph. 2011. Agency rulemaking and political transitions. *Northwestern University Law Review* 105 (2011):471–534.
- Opstrup, Niels, and Anders R. Villadsen. 2015. The right mix? Gender diversity in top management teams and financial performance. *Public Administration Review* 75 (2):291–301.

- Pearson, Kathryn, and Logan Dancey. 2011. Elevating women's voices in congress: Speech participation in the house of representatives. *Political Research Quarterly* 64 (4):910–23.
- Portillo, Shannon, and Leisha DeHart-Davis. 2009. Gender and organizational rule abidance. *Public Administration Review* 69 (2):339–47.
- Potter, Rachel Augustine. 2019. *Bending the rules: Procedural politicking in the bureaucracy*. Chicago, IL: Univ. of Chicago Press.
- Reingold, Beth. 2000. *Representing women: Sex, gender, and legislative behavior in Arizona and California*. Chapel Hill, NC: Univ. of North Carolina Press.
- Reynolds, Andrew. 1999. Women in the legislatures and executives of the world. *World Politics* 51 (4):547–72.
- Rosener, Judy B. 1990. Ways women lead. *Harvard Business Review* 68 (6):119–25.
- Ryan, Michelle K., and S. Alexander Haslam. 2005. The glass cliff: Evidence that women are over-represented in precarious leadership positions. *British Journal of Management* 16:81–90.
- Sabharwal, Meghna. 2015. From glass ceiling to glass cliff: Women in senior executive service. *Journal of Public Administration Research and Theory* 25 (2):399–426.
- Saidel, Judith R., and Karyn Loscocco. 2005. Agency leaders, gendered institutions, and representative bureaucracy. *Public Administration Review* 65 (2):158–70.
- Schiffman, Richard. 2013. Lisa Jackson's legacy at the environmental protection agency, *The Guardian*, January 1. <https://www.theguardian.com/commentisfree/2013/jan/01/lisa-jackson-legacy-environmental-protection-agency>.
- Silverman, Irwin W. 2003. Gender differences in delay of gratification: A meta-analysis. *Sex Roles* 49 (9–10):451–63.
- Smith, Amy E. 2014. Getting to the Helm: Women in leadership in federal regulation. *Public Organization Review* 14 (4):477–96.
- Sneed, Bethany G. 2007. Glass walls in state bureaucracies: Examining the difference departmental function can make. *Public Administration Review* 67 (5):880–91.
- Studlar, Donley T., and Gary F. Moncrief. 1999. Women's work? The distribution and prestige of portfolios in the Canadian provinces. *Governance* 12 (4):379–95.
- Swers, Michele L. 2002. *The difference women make: The policy impact of women in congress*. Chicago, IL: Univ. of Chicago Press.
- Swers, Michele L. 2013. *Women in the club: Gender and policy making in the senate*. Chicago, IL: Univ. of Chicago Press.
- Tamerius, Karin. 1995. Sex, gender, and leadership in the representation of women. In *Gender power, leadership, and governance*, eds Georgia Duerst-Lahti and Rita Mae Kelly, 93–110. Ann Arbor, MI: Univ. of Michigan Press.
- Thomas, Sue. 1991. The impact of women on state legislative policies. *Journal of Politics* 54 (4):958–76.
- Thomas, Sue. 1994. *How women legislate*. New York, NY: Oxford Univ. Press.
- Thomsen, Danielle M., and Michele L. Swers. 2017. Which women can run? Gender, partisanship, and candidate donor networks. *Political Research Quarterly* 70 (2):449–63.
- Volden, Craig, Alan E. Wiseman, and Dana E. Wittmer. 2013. When are women more effective lawmakers than men? *American Journal of Political Science* 57 (2):326–41.
- Volden, Craig, Alan E. Wiseman, and Dana E. Wittmer. 2018. Women's issues and their fates in the U.S. congress. *Political Science Research and Methods* 6 (4):679–96.
- Wilkins, Vicky M. 2007. Exploring the causal story: Gender, active representation, and bureaucratic priorities. *Journal of Public Administration Research and Theory* 17 (1):77–94.
- Wilkins, Vicky M., and Lael R. Keiser. 2004. Linking passive and active representation by gender: The case of child support agencies. *Journal of Public Administration Research and Theory* 16 (1):87–102.
- Wittmer, Dana E., and Vanessa Bouché. 2013. The limits of gendered leadership: Policy implications of female leadership on 'women's issues'. *Politics & Gender* 9 (3):245–75.
- Workman, Samuel. 2015. *The dynamics of bureaucracy in the US government: How congress and federal agencies process information and solve problems*. New York, NY: Cambridge Univ. Press.