The Social Roots of Expertise: Evidence from the IMF

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How do institutions develop expertise in emergent issues? Scholars emphasize top-down professional incentives as a source of expertise acquisition by bureaucracies. We argue that in issue areas marked by intra-institutional discord — where principals send conflicting signals on the value of issue-specific expertise — horizontal socialization across staff instead drives expertise acquisition. We develop this argument in the context of climate change, where principal preferences often diverge or fluctuate. Empirically, we use original data on the composition of Article IV mission teams at the International Monetary Fund, social contacts between thousands of IMF staff, and the contents of IMF policy recommendations issued from 2010–2019. Analyses indicate that intra-staff interactions accelerate bureaucrat learning: staff who work alongside climate-attuned colleagues subsequently issue higher quality advice than staff with professional networks less focused on climate. These findings offer a new social account of bureaucratic expertise and institutional change, and shed light on the sources of effective climate governance.

INTRODUCTION

Political scientists often view institutions as rigid, characterized by path dependency and a sluggish pace of reform in the short term (Riker 1980). Prominent scholarship focuses on major — and rare — exogenous shocks as primary triggers of institutional change (Krasner 1976; Wallander 2000; Young 2010; Colgan, Keohane, and Van de Graaf 2012).[1] Institutional inflexibility is abetted by bureaucratic homogeneity. When the individuals that staff institutions share similar worldviews, it leaves little space for new ideas to take hold (Weaver 2008). Institutions reinforce homogeneity by hiring staffers with shared educational and demographic characteristics (Chwieroth 2015; Nelson 2017) and by strictly monitoring bureaucrat behavior (Honig 2018, 2019).

Yet institutions sometimes rapidly reorient around emergent issues (Jupille, Mattli, and Snidal 2013). Climate change is a prime example — a cross-cutting challenge germane to the mandates of various economic and security institutions. A diverse and growing set of international organizations (IOs) including the IMF, NATO, and the UNHCR have committed themselves to tackle climate issues in recent years.[2]

This paper asks how IOs develop expertise in novel policy domains, with a particular focus on climate change. Theories of bureaucracy typically either take bureaucratic expertise as a given or emphasize top-down drivers of its acquisition, such as discretion granted to staff by political principals (Gilligan and Krehbiel 1987; Gailmard and Patty 2007). But the political novelty of climate, as well as its unique technical complexity, makes it difficult to assume innate issue-specific expertise. Principals of IOs moreover often disagree on climate (Clark and Zucker 2023) and accordingly may fail to send consistent signals to bureaucrats regarding the career value of acquiring expertise. Maintenance of merito-

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[1]Though incremental reforms can be pursued absent such shocks (Blyth 2002; Lipscy 2015; Carnegie and Clark 2023).

[2]*IMF*, 2024, bit.ly/3WZkT1U; *NATO*, 2024, bit.ly/4ctB1x7; *UNHCR*, 2024, bit.ly/3YH6Mjb.

cratic recruitment rules can improve bureaucratic quality (Dahlström, Lapuente, and Teorell 2012), but political institutions are constrained in their ability to hire high-skilled personnel in domains like climate (Singh, Thrall, and Zucker 2024).

This paper advances a new theory of expertise acquisition that focuses on interactions between staff within the same institution. Theories of domestic and international bureaucracies often focus on how staff interact with groups external to their institution, such as legislators (Huber and Shipan 2002), interest groups (Thrall 2023), and foreign officials (Clark and Zucker 2023). There has been less attention to the professional networks present within institutions and consideration of how they might affect bureaucrat behavior and, in turn, institutional performance.

We argue that *intra-staff interactions* generate expertise for IOs. Bureaucrats do not work in isolation within their institutions. Rather, they are frequently assigned to work in teams with colleagues. Examples abound. To surveil member state economies, the IMF assembles small "Article IV mission teams" with staff drawn from across departments. Team members travel to member states, collect and review information, and issue policy recommendations to host governments. The World Bank and other development banks organize small task teams to manage development projects and consult with stakeholders on the ground. The WHO sends emergency medical teams to support local health systems amid disease outbreaks. In all such cases, team members work alongside each other to collect and interpret information, apply institutional rules and procedures, and deliver services. We theorize that the presence of "climate-attuned" bureaucrats on a team — staff attentive to climate change — supports expertise acquisition by team members.

Our empirical focus is the IMF. We compile original data on the personnel composition of Article IV mission teams, the professional networks of more than 3,000 IMF staff, and the content of nearly 8,500 policy recommendations issued in the Fund's surveillance reports between 2010 and 2019. We measure the sophistication of climate-related policy

recommendations to estimate contributing bureaucrats' level of climate expertise.

We find support for our theory. Bureaucrats contribute more sophisticated climate recommendations when they were assigned to work with climate-attuned colleagues earlier in their careers. Climate policy recommendations authored by teams with more climate-attuned staff members are also substantially more sophisticated. Importantly, we find clearer evidence that staff learn from colleagues of equal rank than from managers. This suggests that horizontal socialization plays a key role in promoting expertise acquisition within institutions, alongside the career concerns that stem from top-down monitoring of bureaucrats by managers (e.g., Honig 2018; Copelovitch and Rickard 2021). Although our analysis focuses on the IMF, we believe this mechanism is applicable to a broad range of international and domestic institutions.

This research contributes to several literatures. First, it builds on a growing body of work that highlights preference heterogeneity within IOs (Heinzel, Weaver, and Jorgensen 2024; Kentikelenis, Lang, and Wellner 2024) and domestic bureaucracies (Schub 2022; Jost 2023; Carcelli 2024). While this literature has made strides in identifying how such heterogeneity emerges in the first place (Clark and Zucker 2023), we know less about how it evolves: whether bureaucracies remain divided attitudinally, converge to common understandings of given issues, or end up with some other preference distribution. This paper sheds light on this process, arguing that common interactions between bureaucrats — in particular, the practice of assigning bureaucrats to work on small teams — serve as conveyor belts for disseminating staff preferences across an institution.

Our findings also engage with research on the sources of institutional change and mission creep. Conventional wisdom suggests that institutions are slow to reform and that change comes from the top down (Nielson and Tierney 2003; Lipscy 2015; Kaya 2015; Copelovitch and Rickard 2021). We illustrate how novel ideas can take root at the bottom of an institution and grow upwards. Refining work on mission creep in IOs (Barnett

and Finnemore 1999), our research shows that bureaucrats can develop expertise in novel, complex policy domains.

Finally, to the literature on bureaucratic politics, we highlight an underappreciated source of expertise acquisition. Important work emphasizes top-down incentives for bureaucrats to develop expertise (Gilligan and Krehbiel 1987; Gailmard and Patty 2007). This paper instead highlights the causal importance of horizontal mechanisms: interactions among bureaucrats of roughly equal rank can support the spread of policy knowledge.

THEORY

Expertise acquisition is costly for individual bureaucrats (Gailmard and Patty 2007). This is particularly so for complex, technically intensive policy domains, of which climate is an example (McCarty 2017; Singh, Thrall, and Zucker 2024). Acquiring expertise requires exertion of effort. To the extent that bureaucrats are limited in the effort they can allocate, focusing on climate may erode expertise in other domains and bureaucrats' performance on other professional tasks. The benefits of commanding expertise, however, can be substantial, if somewhat delayed. Expertise improves policy design and institutional performance, and may accordingly be rewarded by principals. Intuitively, bureaucrats should be more likely to invest in gaining expertise when costs fall or expected benefits rise.

We theorize that interactions between IO bureaucrats affect the costs of and the perceived returns to developing expertise. Interactions may lower the costs of expertise acquisition by simply facilitating exchanges of climate knowledge. For example, a climate-attuned IMF bureaucrat may inform novice colleagues about economic models for projecting climate damages. Interactions may also mitigate the perceived costs of deviating from institutional mandates; there is often substantial disagreement as to whether climate is pertinent to IOs' missions (Clark and Zucker 2023). Colleagues may actively persuade each

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other as to climate's relevance. Engagement with more climate-attuned staff may also exert more subtle socialization pressures. Independent of their beliefs about climate's pertinence, bureaucrats may seek to "fit in" by becoming conversant in climate.[3]

Intra-staff interactions may also alter perceptions of the returns to gaining expertise. Disagreement on the value of climate governance at the highest ranks of IOs may dampen the perceived career benefits of being expert in climate. Discussions with climate-attuned staff may counteract this by adjusting prior beliefs about the distribution of climate preferences within an institution. Beliefs that the institution houses more pro-climate personnel than previously thought may reduce the perceived risk of professional backlash from embracing climate.

By modifying the perceived costs and benefits of acquiring expertise, interactions with more climate-attuned staff should increase the climate expertise of a given bureaucrat. Articulated as a testable hypothesis:

Hypothesis 1. *Interactions with climate-attuned colleagues increase bureaucrats' climate expertise.*

DATA AND MEASUREMENT

We test this theory with original data on the career paths of individual IMF bureaucrats, interactions between bureaucrats, and the sophistication of IMF policy recommendations. Our source for these data are Article IV reports, which are the products of semi-annual surveillance missions undertaken by IMF staff teams to individual member states. These reports, which are authored by small groups of IMF staff, describe in detail the state of countries' economies, identify macroeconomic risks, and offer policy advice to host country governments.

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[3]This is consistent with the idea of mimicry as a form of socialization, which Johnston 2008 identifies at elite levels within IOs.

We collected data on all 611 Article IV reports issued between 2010–2019, a period during which IMF attention to climate grew dramatically. From these reports, we identify 3,073 mid-level IMF personnel: resident representatives, mission chiefs, and rank-and-file mission team members.[4] Based on the reports to which they contributed, for each staff member in our dataset we record the countries they worked in, when they worked there, and, critically, the other personnel on the mission teams they were assigned to. Our data include 4,495 unique bureaucrat-mission observations.

We also extract 8,496 unique policy recommendations from these reports. Using a dictionary of climate-related keywords (Appendix A), we identify 300 policy recommendations that explicitly relate to climate change or decarbonization. We use these policy recommendations to estimate the climate expertise of contributing authors. To do so, we assume that the sophistication of the language used in the reports increases with bureaucrats' expertise. We measure sophistication by calculating the "lexical richness" of each policy recommendation, a measure of "the number of different terms used in a text and the diversity of the vocabulary" (Torruella and Capsada 2013, 448).[5] The sophistication of climate and non-climate recommendations follow similar normal distributions (Appendix B).

Table 1 lists example recommendations at low, medium, and high levels of sophistication. As the examples suggest, low-sophistication recommendations are often brief and involve fairly non-specific advice. More sophisticated recommendations tend to be longer, exhibit deeper engagement with local conditions in a given country, and offer more specific and actionable policy advice. These attributes, in our view, indicate a higher level of

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[4]Resident representatives are IMF staff who are stationed in an assigned member state for a period of a couple of years at a time. Mission chiefs are typically drawn from IMF area departments (e.g., the Asia and Pacific Department) and lead the surveillance trips to member states, which typically last for less than a month. Rank-and-file staff are drawn from area departments and functional departments (e.g., the Monetary and Capital Markets Department). Mission teams generally include one resident representative, one mission chief, and 5–10 rank-and-file staff.

[5]We calculate lexical richness using Carroll's corrected type-token ratio, which is defined as $V/\sqrt{2N}$, where V is the number of "types" (unique words) present in a string and N is the number of words in that string.

climate expertise among contributing authors. We do not observe consistent changes in the aggregate sophistication of climate policy recommendations over time (Appendix C).

Recommendation	z-score
Fiji's susceptibility to natural disasters and narrow export base suggest the need to continue building fiscal buffers to respond to adverse developments.	-2.60
Samoa needs to build fiscal resilience and buffers against natural disasters and achieve progress towards its development goals. At the same time, Samoa needs to ensure fiscal sustainability and use fiscal policy as the principal instrument of macroeconomic management in the face of external shocks, given the exchange rate peg and the weak monetary policy transmission mechanism. The needed adjustment can be achieved by improving tax administration and controlling current spending.	$+0.09$
The Bahamas has traditionally absorbed frequent natural disater shocks ex post through the public balance sheet. An increased reliance on ex ante mitigation policies would help reduce and smooth the economic and fiscal impact of natural disasters. To this end, staff recommended integrating a well-designed natural disasters savings arrangement into the fiscal framework, insuring public assets through private natural disaster insurance and incentivizing the population to use these instruments more widely, including through targeted subsidies to improve affordability for low-income households - and making sure that building regulation, land use, and zoning guidelines are adequate and are reviewed and updated frequently.	$+1.36$
To create fiscal buffers, including to deal with future natural disasters, and to help ensure that public debt-to-GDP ratios remain on a clear downward path, staff recommended eliminating the primary fiscal deficit after grants by 2022 through a combination of revenue-enhancing measures (i.e., eliminating VAT exemptions except for basic goods) and spending rationalization (i.e., review and reform of wage and hiring policies in the public sector). Tax administration reforms to boost revenue collection should continue, by improving the taxpayers' registry and electronic information systems, enhancing tax compliance from large taxpayers with adequate risk analysis, and strengthening the extractive industry tax management. Meanwhile, the impact of these measures on the most vulnerable will be mitigated through increases in social spending assistance.	$+1.86$

Table 1: Sample of IMF policy recommendations, in ascending order by sophistication (z-scores of Carroll's corrected type-token ratios).

ANALYSIS

We conduct two primary analyses. First, we examine whether bureaucrats who interact with climate-attuned colleagues subsequently exhibit greater climate expertise. To conduct this analysis, we estimate the following model by ordinary least squares:

$$\text{sophistication}_{ict} = \beta \left[\mathbb{I}(\text{climate} = 1) \times \text{prior coworker attention}_{i(t-1)} \right]$$
$$+ \gamma \text{climate disasters}_{c(t-1)} + \alpha_i + \zeta_t + \varepsilon_{ict}$$

This regresses the sophistication of a given policy recommendation coauthored by bureaucrat i in country c in year t on the climate relevance of that recommendation, interacted with the climate attentiveness of the bureaucrat's colleagues on prior missions.[6] We control for the count of climate disasters experienced in country c and include bureaucrat and year fixed effects.[7] We cluster standard errors by bureaucrat and mission.

Table 2 reports the results of two versions of this test. In Model 1, we aggregate all of the staff with whom bureaucrats' previously worked on missions. In Model 2, we disaggregate these prior teammates by seniority: whether they were a mission chief or rank-and-filer. Results of Model 1 match our theory: bureaucrats who once worked alongside more climate-attuned staff subsequently issue more sophisticated climate policy recommendations. A standard increase in prior coworkers' climate attentiveness increases the sophistication of these recommendations by 10% of a standard deviation in expectation, in comparison to non-climate recommendations.

Results of Model 2 indicate that staff learn specifically from rank-and-file colleagues; there is inconclusive evidence as to the effect of climate-attuned mission chiefs. We esti-

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[6] We calculate climate attentiveness as the number of climate-focused policy recommendations issued by those colleagues prior to their interaction with bureaucrat i.

[7] To measure climate disasters, we aggregate climatological and meteorological disasters recorded in the EM-DAT database.

	(1)	(2)
Climate-relevant recommendation	0.139**	0.139**
	(0.052)	(0.052)
Previous coworker mentions of climate	−0.003+	
	(0.002)	
Climate disasters	−0.001	−0.001
	(0.004)	(0.004)
Climate × previous coworker mentions	0.019***	
	(0.005)	
Previous co-staffer mentions of climate		−0.002
		(0.003)
Previous mission chief mentions of climate		−0.034*
		(0.016)
Climate × previous co-staffer mentions		0.024***
		(0.007)
Climate × previous mission chief mentions		0.033
		(0.021)
N	50046	50046
Bureaucrat FE	✓	✓
Year FE	✓	✓

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Regressions of policy recommendation sophistication (standardized) on the climate attentiveness of previous mission team members, interacted with the climate focus of the recommendation. Standard errors clustered by report and bureaucrat.

mate that a standard increase in rank-and-filers' climate attentiveness increases the relative sophistication of bureaucrats' future climate recommendations by 8% of a standard deviation. The point estimate for mission chiefs is similar but statistically insignificant.

In our second analysis, we test whether climate policy recommendations become more sophisticated when more climate-attuned staff are involved in their composition. We esti-

mate the following model by OLS:

$$\text{sophistication}_{rct} = \beta \left[\mathbb{I}(\text{climate} = 1) \times \text{team climate attentiveness}_{r(t-1)} \right]$$

$$+ \gamma \text{climate disasters}_{c(t-1)} + \zeta_t + \varepsilon_{rct}$$

This regresses the sophistication of recommendation *r* on its climate relevance, interacted with the mean climate attentiveness of staff who contributed to that recommendation. We measure the latter variable as the average number of climate-focused policy recommendations cumulatively issued by mission team staff. We control for country-level climate disasters as before and incorporate year fixed effects. Standard errors are clustered by the mission that produced a given recommendation.

	(1)
Climate-related recommendation	0.108*
	(0.050)
Team climate attentiveness	−0.029*
	(0.013)
Climate × team attentiveness	0.074*
	(0.030)
Climate disasters	0.002
	(0.003)
N	7268
Year FE	✓

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 3: Regressions of policy recommendation sophistication on the average number of prior climate discussions by staffers, interacted with the climate focus of the recommendation. Standard errors clustered by report.

Table 3 reports estimation results. Consistent with our theory, the relative sophistication of climate policy recommendations (compared to non-climate recommendations) grows when more climate-attuned staff contribute to their composition. A standard in-

crease in team attentiveness is estimated to increase recommendation sophistication by 4% of a standard deviation. This offers further evidence that interpersonal dynamics within the IMF support expertise acquisition and augment the quality of institutional outputs.

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LIST OF APPENDICES

A. CLIMATE KEYWORDS

We use keyword searches to identify climate-related policy recommendations. Recommendations are coded as climate-relevant if they include at least one of the following terms:

- "adaptation"
- "bali action plan"
- "bali roadmap"
- "cap and trade"
- "carbon"
- "clean development mechanism"
- "climate change"
- "climatenchange"
- "climate changen"
- "climate finance"
- "climate politics"
- "conference of the parties"
- "disaster risk"
- "disaster hazard"
- "emissions trading scheme"
- "framework convention on climate change"
- "ghg"
- "global average temperature"
- "global environmental facility"
- "global warming"
- "green climate fund"
- "greenhouse effect"
- "greenhouse gas"
- "greenhousengas"
- "environmental politic"
- "environmentalnpolitic"
- "intergovernmental panel on climate change"
- "ipcc"
- "kyoto protocol"
- "mitigation"
- "nationally determined contribution"
- "natural disasters"
- "paris accord"
- "paris agreement"
- "renewables"
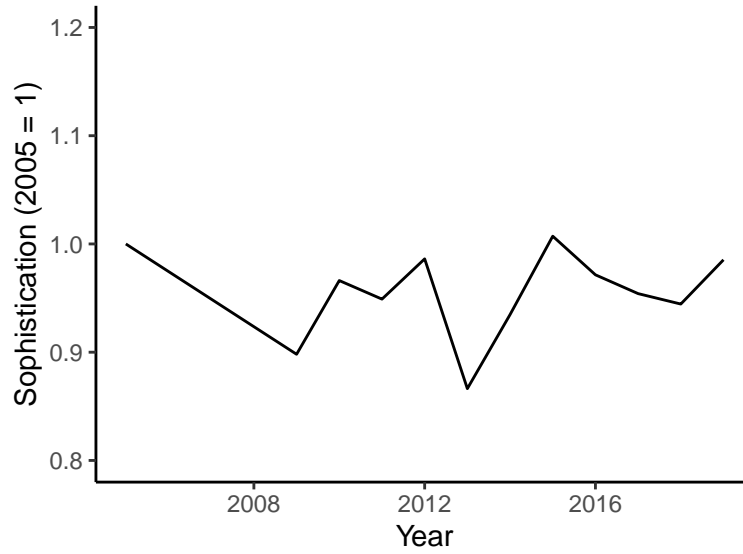- "renewable energy"
- "renewablenenergy"
- "unfccc"

B. DISTRIBUTION OF SOPHISTICATION
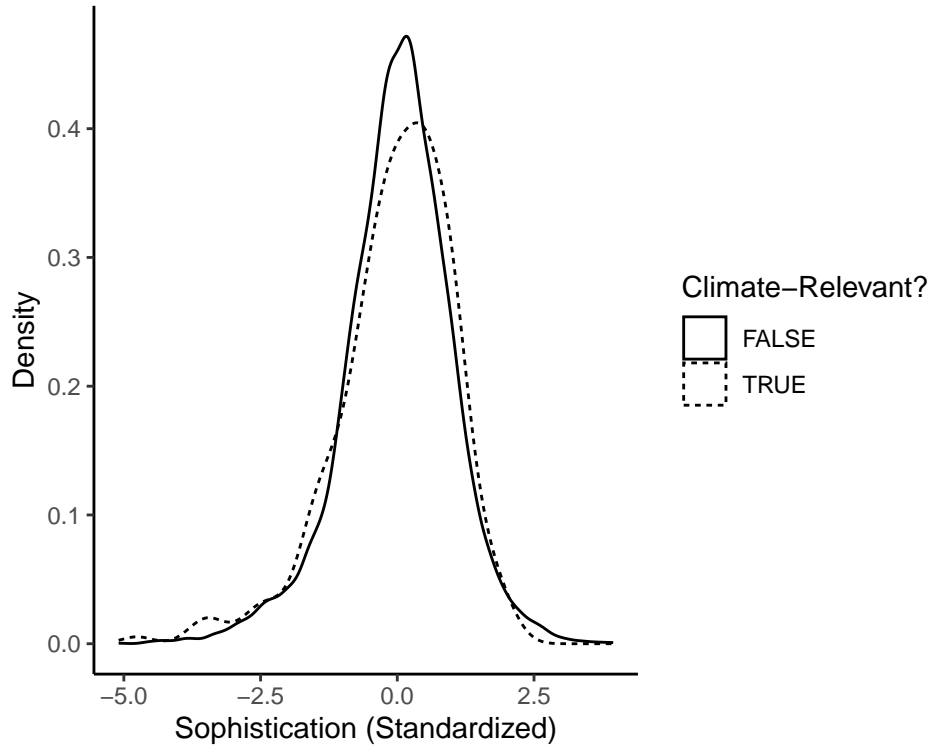
Figure B1: Distribution of the sophistication of policy recommendations.

C. SOPHISTICATION OVER TIME

Figure C1: Mean sophistication of climate-related policy recommendations over time, indexed to sophistication in 2005.