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Climate Cascades: IOs and the Prioritization of Climate Action

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Abstract: *International organizations (IOs) are rapidly reorienting around climate change, despite powerful principal states having divergent preferences on the issue. When and why do IOs prioritize climate change? We argue that they do so as a result of an endogenous process of staff learning and rotation. IO staff surveil and implement programs in target states. When working in climate-vulnerable countries, they come to see climate change as an issue warranting aggressive action. As these staff are rotated and promoted, interest in climate diffuses outwards and upwards through the institution. To test this theory, we introduce original data tracking the International Monetary Fund's attention to climate change and the career paths of key staff. We complement this with interviews of International Monetary Fund personnel. We find support for our theory.*

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Climate change is quickly moving to the fore of the global governance agenda. Beyond the creation of dedicated climate institutions, international organizations (IOs) established for distinctly non-climate purposes are increasingly focusing their policy-making on climate. The Director-General of the World Trade Organization recently called for "harness[ing] the power of trade for the environment"(WTO 2021). The Bank for International Settlements has sounded the alarm on climate-related financial risks (Bolton et al. 2020). The World Bank announced plans in the late 2010s to ramp up lending for climate-related projects, with its president declaring that climate change presents "critical challenges to [the Bank's] development efforts" (World Bank 2020). Christine Lagarde, as managing director of the International Monetary Fund (IMF), labeled climate change "the great existential challenge of our times," advocating for carbon prices and the removal of fossil fuel subsidies (Lagarde and Gaspar 2019).[1]

These rapid pivots on the topic of climate are notable given the struggles to conclude ambitious international climate pacts (Victor 2011). Institutions, such as the IMF and World Bank, are known to be readily influenced by powerful member states, such as the United States, the European Union, and China (Clark and Dolan 2021; Copelovitch 2010a; Hernandez 2017; Kaya 2015; Kersting and Kilby 2021; Nelson 2017; Stone 2011).[2] Yet both institutions sharpened their focus on climate despite these stakeholders' varied embrace of climate

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[1] See Dellmuth, Gustafsson, and Kural (2020) on emergent climate governance at other IOs.

[2] Great powerful influence is apparent at other IOs, such as the Asian Development Bank, where Japan is uniquely powerful (Kilby 2011; Lim and Vreeland 2013), and the China-led Asian Infrastructure Investment Bank (Kaya, Kilby, and Kay 2021).

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action at home and abroad.[3] Powerful states' agreement and initiative is seen as critical to global climate governance and institutions' prioritization of environmental protection (Barrett 2005; Colgan, Keohane, and Van de Graaf 2012; Graham and Serdaru 2020; Nielson and Tierney 2003). Against this backdrop of international division on climate, why are IOs nonetheless devoting more resources to climate governance?

We argue that institutions can expand their policymaking to novel issue areas, such as climate, due to internal staff learning and rotation. Prior work links institutional change to exogenous or top-down forces, such as shifts in principals' preferences or abrupt "critical junctures" that break institutions' path dependency (Gerschewski 2021; Gunitsky 2014; Krasner 1984); such punctuated equilibrium models have been applied to the energy and environmental regimes (Colgan, Keohane, and Van de Graaf 2012; Young 2010). The process we describe is instead endogenous, emerging from the bureaucratic structure of an institution's middle and lower ranks, and unlike other accounts of endogenous change, potentially fast acting.[4]

Bureaucrats at IOs surveil and implement policies in target states. World Bank staff oversee infrastructure projects overseas, International Atomic Energy Agency experts frequently inspect foreign nuclear facilities, and IMF personnel travel to monitor economies and implement IMF programs. Bureaucrats at domestic institutions, such as foreign ministries and aid agencies, are similarly subject to regular rotation overseas (Honig 2018; Malis 2021). We contend that when working in countries with highly salient climate vulnerabilities, staff learn to see climate change as an issue warranting action by their institution due to their experience of physical climate damages. As these staff rotate to other countries and progress through their institutions' hierarchies, climate concerns proliferate horizontally and vertically independent of any pressure from powerful principals or the institutions' chief executives.

We test this theory using new data on the IMF's attention to climate change and IMF bureaucrats' career paths. These data draw from Article IV reports published by the IMF, which summarize findings from the routine surveillance of member state economies and identify risks to economic growth and stability. We code which reports discussed climate change between 2000 and 2018 and identify the staff involved in the drafting of each report. This allows us to document the IMF's increased focus on climate over time and the movement of climate-attuned staff through the institution's bureaucracy.

To gain causal leverage, we exploit the as-if random nature of bureaucrat exposure to physical climate damages while on assignment as well as a system of bureaucrat rotation between states that is plausibly exogenous to the local salience of climate and bureaucrats' attitudes on the subject. While there may be other drivers of institutional embrace of climate action, such as chief executive preferences (Copelovitch and Rickard 2021), we demonstrate that bottom-up learning is empirically distinct from these alternative factors.

Data show that within a single decade, climate rapidly went from an issue rarely considered in IMF analyses to one at the fore of its agenda. This shift originated, at least in part, in bureaucrats' observation of local climate damages while abroad; we find that staff were more likely to first become attentive to climate-related economic risks after experiencing nearby climate-related natural disasters. This learned attentiveness to climate was sticky; staff continued to discuss climate risks even after being transferred to countries where such risks, while still present, were less salient. Interviews with IMF officials inform these statistical tests of a bottom-up learning and diffusion process.

This article's theory and findings contribute to a growing literature on the role of individual bureaucrats in shaping IO policymaking. Prior accounts often focus on bureaucracy-level characteristics rather than potential differences across staff within the same institution (Barnett and Finnemore 1999; Clark and Dolan 2021; Momani 2007). This article refocuses on this variation in staff preferences, documenting how individual bureaucrats can swiftly alter organizational trajectories in the course of carrying out their normal responsibilities. These findings refine the literature on the autonomy and influence of staff in contexts of great power influence (Arias 2022; Chwieroth 2013; Clark 2021; Copelovitch 2010a; Fleischer and Reiners 2021; Lang and Wellner 2021; Winters and Streitfeld 2018). We moreover illustrate how bureaucrat preferences are not fixed but subject to substantial change amid learning in the field (Honig, 2018, 2020; Woods 2007).

This article also extends the literature on institutional change. Much of the existing literature pinpoints exogenous watershed events as sources of change, notably as part of punctuated equilibria models (Gerschewski 2021). Conversely, we suggest that rapid change can occur endogenously as a result of anodyne organizational management practices, such as the rotation of low- and

[3]Preference heterogeneity among principals impedes their ability to affect change at IOs (Copelovitch 2010a,b; Colgan, Keohane, and Van de Graaf 2012; Schneider and Tobin 2013; Schneider 2014). Both the IMF and World Bank also pivoted to climate during Donald Trump's administration, which sought to undermine global climate cooperation (Carnegie, Clark, and Zucker 2023).

[4]Scholars have to date "overlooked" rapid, endogenous forms of institutional change (Gerschewski 2021, 218).

mid-level bureaucrats. This argument expands the literature on norm cascades and ideas as sources of political change (Checkel 2003; Chwieroth 2008; Finnemore and Sikkink 1998), offering further evidence of the epistemic processes that underlie governing bodies' varied attention to environmental issues (Allan 2017; Haas 1992).

Bureaucratic Theory of Multilateral Climate Governance

Scholars have argued that IOs evolve due to preference changes among principal states, the efforts of chief executives, or exogenous shifts in the broader political environment. Powerful principals exert strong influence via formal and informal levers and accordingly are well situated to induce policy change (Clark and Dolan 2021; Nelson 2017; Nielson and Tierney 2003; Stone 2011)—particularly when there is a consensus among principals on the need for institutional reform (Colgan, Keohane, and Van de Graaf 2012). Ideological leaders of IOs likewise have broad sway over their institutions' trajectories (Copelovitch and Rickard 2021). Punctuated equilibrium models link institutional transformations to exogenous shocks, such as war or shifts in the global balance of power (Dreher, Sturm, and Vreeland 2015; Gunitsky 2014; Jupille, Mattli, and Snidal 2013; Krasner 1976; Lipscy 2015; Wallander 2000; Young 2010).

A growing body of literature suggests that bureaucrats may be able to affect institutional policymaking from the bottom up. This work often explores the sources and effects of homogeneity among bureaucrats, owing to common educational or national backgrounds (Chwieroth 2015; Clark and Dolan 2021; Nelson 2017), or to shared expertise and organizational cultures (Clift and Robles 2021; Huber and Shipan 2002; Yarhi-Milo 2013).[5] We diverge from such accounts by emphasizing the malleability of bureaucrat preferences and, in turn, the potential for cleavages to develop between staff at the same institution.

We theorize that staff learn from their experiences and career progression within their institution. Staff within both IOs and foreign-facing domestic institutions are often deployed to a country for a mission before being transferred elsewhere or promoted to new positions (Honig 2018; Malis 2021). We argue that as bureaucrats move within their institution, they carry the lessons learned from prior assignments with them. In the process, preferences developed in the relatively weak states that often host IO officials spread horizontally and vertically through the institution.

We develop this argument in relation to climate change, an emergent issue marked by deep contestation between wealthy states in the Global North and poorer, more climate-vulnerable states in the Global South (Ciplet, Roberts, and Khan 2012) as well as among those wealthy states themselves (Victor 2011). We contend that when staff are sent to countries with readily observable climate vulnerabilities, such as low-lying island states, those staff learn about the political, social, and economic challenges posed by climate change. This learning occurs via direct observation of local physical climate damage and subsequently prompts a reconsideration of what their institution's mandate encompasses.

A bureaucrat's understanding of what falls within their institution's purview is sticky, determined by their prior training and organizational lenses (Nelson 2017; Weaver 2008; Yarhi-Milo 2013). But these conceptions are not entirely fixed. Staff may reconsider what is covered by their institution's mandate, and thus deserving of attention, due to their activities in the field (Honig 2018; Howard 2008; Howard and Dayal 2018; Woods 2007). While routine procedures within institutions can impede learning (Benner, Eckhard, and Rotmann 2013; Howard and Dayal 2018), acute realizations of climate risk—experiences of climate-related disasters—may shock bureaucrats in ways that disrupt status quo operating procedures.

When bureaucrats are transferred to other countries or promoted to more senior posts, they might bring learned climate concerns with them, applying a climate-attuned lens to contexts where climate risks are less conspicuous. Experiences of climate disasters can, in this way, prompt bureaucrats to develop "new understandings of problems and their causes" that they carry between countries, such as a new appreciation of climate change's potential to foment economic instability and impede growth (Howard 2008, 19).[6] Though memories of vivid personal experiences tend to endure (Kolb 2015; March 2010), we do not assume that bureaucrats will remember the granular details of climate risk in each country they visit. Rather, bureaucrats should retain the broader belief that climate change is germane to their institution's mission.[7]

[5] See Lang and Wellner (2021) on variation in bureaucrat hawkishness at the IMF.

[6] Howard (2008) defines this as "second-level learning"—the transfer of lessons from one mission to another. See also Campbell (2008).

[7] We do not claim that bureaucrats necessarily are or become climate experts. Scholars distinguish the experiential learning we focus on here from academic knowledge "generated by systematic

These learning and diffusion processes should operate to the extent that powerful member states and institution leaders are unable or unwilling to impede them. Divisions among powerful states on climate change may limit top-down oversight, allowing bureaucrats greater autonomy (Copelovitch 2010a, 2010b; Schneider 2014). Imperfect monitoring by principals and managers can grant field agents substantial slack (Honig 2018; Woods 2007). Moreover, concerns about institutional legitimacy may constrain principal interference in the bureaucracy (Stone 2011).[8]

For the IMF, the risks to economic growth and stability that stem from climate change are particularly relevant. Regulators and policy makers have in recent years become more attuned to the economic risks associated with climate change-induced asset revaluations (Colgan, Green, and Hale 2021). Decarbonization of the global economy may erode the value of carbon-intensive, fossil fuel-reliant assets. The physical damages of climate change threaten to devalue climate-vulnerable assets, such as farms in arid regions. Realizations of such risks may destabilize financial systems and undermine economic output (Batten, Sowerbutts, and Tanaka 2016; Brunetti et al. 2021). The IMF today refers to regulation of these climate risks as a core pillar of its climate strategy, alongside the provision of assistance to "contain and reduce emissions" and "[build] financial and institutional resilience to natural disasters and extreme weather events" (IMF 2023).

IMF attention to climate has grown despite disagreement among its largest principals on the issue. The European Union, a powerful bloc at the Fund (Copelovitch 2010a), has been relatively willing to enact costly climate policies (BBC News 2021). But in the United States, a veto player at the Fund (Stone 2011), the Trump administration actively sought to undermine climate governance, and congressional Republicans have explicitly rejected efforts to monitor climate risks to the financial system (Siegel 2021). Japan, another major shareholder, has pursued a coal-centric energy mix at home and through its foreign aid programs (Incerti and Lipscy 2018). China, whose influence is growing (Kaya 2015), similarly maintains fossil fuel-heavy domestic and foreign economic strategies (Climate Action Tracker 2023). The private sectors of such countries also have weak track records on climate (Green et al. 2022).

This preference heterogeneity among principals may grant staff greater discretion over climate.[9] Copelovitch (2010a) shows that powerful states intervene at the IMF most when their preferences are homogeneous and intense. Other scholars similarly document preference alignment as a precondition for top-down, principal-led reform, including in the domain of energy and the environment (Colgan, Keohane, and Van de Graaf 2012; Schneider 2014; Schneider and Tobin 2013). For such states to shift the Fund's climate strategy, they would have to be aligned on the issue and willing to expend political capital, which they do judiciously (Stone 2008). However, IMF principals diverge widely on climate change, as noted above, and disagree on whether it should be incorporated into the Fund's activities.[10] Moreover, states may prioritize surveillance operations less than the design of costlier, binding policies, such as loan conditionalities, where staff are responsive to principal preferences (Clark and Dolan 2021). This should hinder coordinated top-down action on the issue.

We argue that the IMF's growing attention to climate originates instead from its internal system of staff deployment and rotation. The Fund regularly stations staff in member states to engage with local stakeholders and conduct routine economic surveillance, identifying macroeconomic risks and making policy recommendations to avert or stem economic crises. After being in a country for a time, staff are rotated to other member states or transferred to other positions within the Fund. We argue that climate risks become more salient for staff upon deployment to countries with especially stark and immediate climate vulnerabilities.

While most countries are vulnerable to the physical effects of climate change (Ricke et al. 2018), the immediacy of such climate risks varies. We expect the IMF's pivot to prioritize climate change to have been triggered, at least in part, by countries coping with *realized* climate risks (e.g., climate-related disasters)—countries where climate damages are uniquely apparent and therefore relevant to the Fund's mandate, which concerns the resolution of short-term macroeconomic imbalances. In countries such as Bangladesh and the Marshall Islands issues of rising sea-levels are readily observable and

observation and analysis by experts [...] without direct experiential confirmation" (March 2010, 9). Rather, we anticipate that bureaucrats will come to see climate as relevant to their institution's mandate, which could spur the institution to invest in *acquiring* climate expertise (see the current effort by the IMF [bit.ly/3CAnmX0]).

[8]Bottom-up and top-down processes may coexist and reinforce each other. But they have distinct origins (e.g., learning in the field versus IO leaders' ideology or interest in forging alliances with other institutions; Copelovitch and Rickard 2021; Lall 2017).

[9]Sympathetic managing directors (Christine Lagarde and Kristalina Georgieva) also likely allowed staff greater leeway on climate. Assent from leaders may enable this bottom-up mechanism to operate.

[10]Interviews with IMF officials (July 28, 2021).

central to local political and economic discourse (Paprocki 2018). Having observed these realities in situ, bureaucrats posted in these countries may become more attuned to climate risks than they previously were, given the immediate implications for economic growth and stability. This resonates with findings that experiencing climate damages affects concern about climate change and can prompt greater investment in climate action (Bergquist and Warshaw 2019; Hazlett and Mildenberger 2020).

Upon rotation to countries where climate risks have yet to manifest with such intensity, climate-attuned bureaucrats might *continue* to place greater emphasis on climate risks in their macroeconomic analyses. We anticipate that such bureaucrats will have begun to think about climate as a "macro-critical" issue, something deserving of the Fund's attention alongside traditional balance-of-payments issues, such as state ownership, public spending, and inflation. Observation of local climate damages should augment bureaucrats' attention to *global* climate risks, not merely those present in a single country.

This leads to two hypotheses. First, IMF staff are more likely to initially consider climate change in economic analyses when stationed in countries with realized climate risks, having learned about climate's relevance to the Fund's mandate.

Hypothesis 1. *Bureaucrats are more likely to first consider climate change when stationed in a country with salient and immediate climate vulnerabilities (realized climate risks).*

Second, staff attentive to climate risks will continue to consider climate in subsequent economic analyses, even after being rotated to countries with less pronounced climate vulnerabilities.

Hypothesis 2. *Bureaucrats are more likely to consider climate change in economic analyses if they previously did so in prior country postings.*

Data

We test this theory using original data on IMF attention to climate change and the career paths of individual IMF staff. To gain causal leverage, we exploit the as-if random nature of bureaucrats' exposure to climate damages and the plausible exogeneity of bureaucrat assignment and rotation. We assume that bureaucrats predisposed to discussing climate do not select into more climate-vulnerable countries, neither when first experiencing climate disruptions nor when moving to new countries. We justify this assumption statistically and qualitatively. We additionally examine whether our results are artifacts of reasonable outside causal factors—pressure from member states, IMF colleagues and departments, and the IMF chief executive—finding this to be unlikely.

Measurement

We measure IMF attention to climate change via Article IV reports, which are produced following routine annual surveillance missions by IMF staff to member states.[11] As part of an Article IV mission, staff visit "a country to assess economic and financial developments and discuss the country's economic and financial policies" with a range of government, business, and civil society actors (IMF 2021).[12] The reports are ultimately furnished to IMF executives and its governing board, and take a somewhat longer term perspective than the conditional standby arrangements that accompany IMF loans.[13] These documents, which exemplify the IMF's role as an influential source of economic expertise, may ultimately affect policy choice and investor behavior in surveiled states (Breen and Doak 2023; Cormier and Manger 2022; Goes and Chapman 2021). We analyze all reports published between 2000 and 2018, coding mentions of "climate" (checked to be relevant to climate change) in each.[14]

Figures 1 and 2 show that climate has been discussed for a rapidly growing set of countries, a trend reminiscent of norm cascades (Finnemore and Sikkink 1998). Between 2010 and 2018, the number of countries with an Article IV report discussing climate nearly quintupled (Figure 1a). A similar pattern is apparent when tracing the cumulative sum of climate mentions across all Article IV reports, as well as when examining climate discussion in staff working papers (Figure 1b–d). Figure 2 indicates

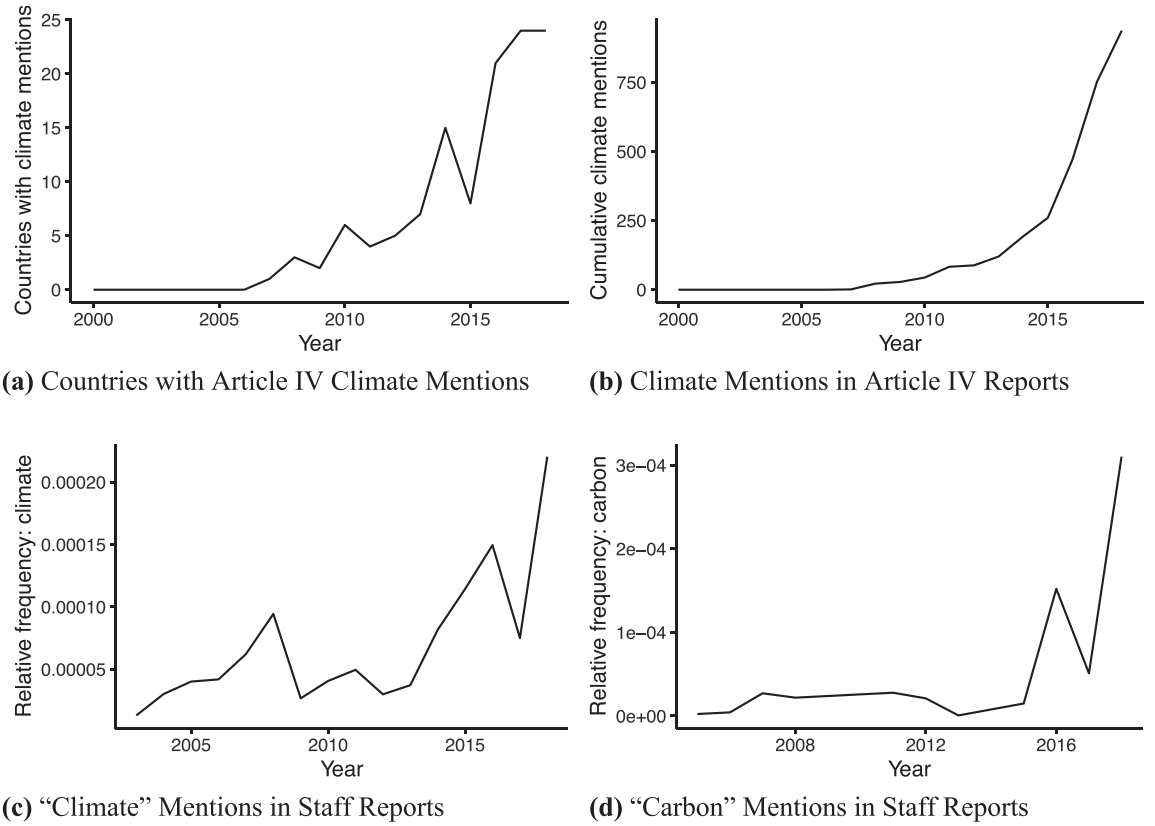
[11]We collect the reports from the IMF Monitor Article IV Scanner [articleivscanner.imfmonitor.org] (Kentikelenis, Stubbs, and King 2016), which contains reports published since 2000. Climate change is unlikely to have been discussed prior to this year; no IMF working paper in the 1990s mentioned climate (authors' analysis of machine-readable working papers available online [ideas.repec.org/s/imf/imfwpa.html]).

[12]Countries are surveyed every one and a half years on average in our data set. Delays can occur as a result of unstable political situations (IMF, 2018, [bit.ly/37gy302]).

[13]Interview with IMF official (June 7, 2021).

[14]Vietnam's 2020 report notes, for example, that "climate change impacts all sectors of the economy and threatens to stall or reverse progress on growth and poverty reduction" (Country Report No. 21/42). The 2015 report for the U.S. calls for imposition of a carbon tax and for the U.S. to assume "a leadership role [on climate]" (Country Report No. 15/168).

FIGURE 1 Climate Mentions in IMF Analyses over Time



(a) Countries with Article IV Climate Mentions

(b) Climate Mentions in Article IV Reports

(c) "Climate" Mentions in Staff Reports

(d) "Carbon" Mentions in Staff Reports

Notes: Climate mentions in Article IV reports (a–b) and IMF working papers (c–d). Relative frequency is calculated as number of mentions over all words.

that climate mentions originated in small, highly vulnerable regions before swiftly spreading to larger, wealthier countries.

We identify the IMF resident representative associated with each report that discusses climate. Resident representatives offer technical assistance to host governments and assist in Article IV missions.[15] They live and work in their assigned country for multiple years before being rotated to a new country or promoted to a new post and are accordingly appropriate subjects for our analysis.[16] Resident representatives are not solely responsible for Article IV reports; mission chiefs sent from IMF area offices often assume a leading role. But mission chiefs are stationed abroad only briefly—the average Article IV visit lasts less than two weeks (Edwards and Senger 2015; Reichmann 2012). They are consequently unlikely to learn as much about local climate impacts as resident representatives, who engage more with local stakeholders and possess "greater knowledge of local conditions" (IMF IEO 2013, 25). This informational advantage should enable resident representatives to affect reports even if mission chiefs are the final authority.[17]

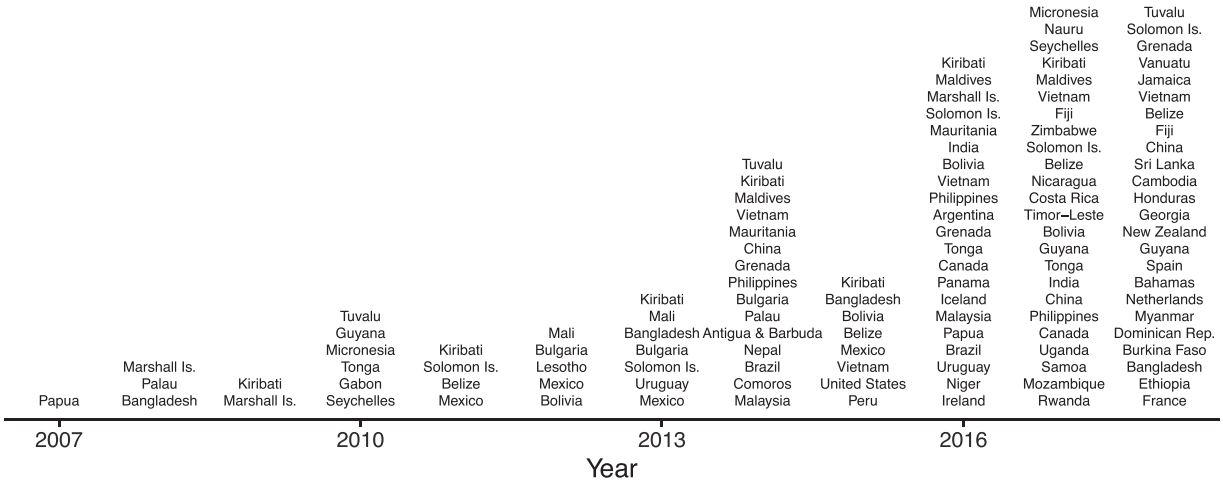
We record resident representatives' career paths at the Fund, using LinkedIn profiles and online IMF doc-

[15]These staff were initially only deployed to countries receiving conditional IMF loans (IMF, 1973, [bit.ly/3oQrYPZ]). In more recent decades, most states have continuously hosted a resident representative. In cases where a country lacks a resident representative, we instead code the country's Article IV mission chief.

[16]Our data include 73 officials. The median length of stay for those in our sample is two years, consistent with figures in IMF documentation (IMF, 1973, [bit.ly/3oQrYPZ]). IMF bureaucrats are largely of Western nationality or education (IMF, 2019, [bit.ly/3jqjmhK]). We do not find that bureaucrats in our sample have consistently long or short tenures at the IMF; 22% were on assignment overseas for five years or less and 22% for at least 15 years (see Appendix A, 2).

[17]See Heinzel (2022) on bureaucrat knowledge and influence. Mission chiefs would confound our tests if they rotated between countries in tandem with resident representatives; we find no evidence suggesting this to be the case. IMF departments, such as the Fiscal Affairs Department, may similarly affect Article IV reports. But the lack of climate expertise in these departments during our sample period makes it unlikely that they frequently injected climate language into bureaucrats' reports (Laxton, Smith, and Neunuebel 2022).

FIGURE 2 Countries with Article IV Climate Mentions



Notes: Set of countries with climate mentions in Article IV reports by year.

umentation to record the years in which each was stationed in different countries while an IMF employee. These data offer suggestive support of this article's theoretical intuition: the countries most "central" to climate-attuned bureaucrats' career paths are climate-vulnerable countries in the Global South (Appendix B, 3).

We then measure bureaucrats' exposure to realized climate risks—climate-related natural disasters—while on assignment. To do so, we draw on the EM-DAT International Disaster Database, aggregating disasters defined as climatological, "caused by intra-seasonal to multi-decadal variability," with those classified as meteorological, involving short-term weather extremes (Below, Wirtz, and Guha-Sapir 2009; EM-DAT 2021). This definition encompasses such climate-related disasters as extreme temperatures, droughts, storms, and wildfires.

Selection and Inference

Bureaucrat exposure to climate disasters is as-if at random and accordingly "plausibly exogenous" (Conley, Hansen, and Rossi 2012) with respect to bureaucrats' prior climate attitudes. Staff rotation between member states is likewise plausibly exogenous to local climate damages and bureaucrats' climate attitudes. Dunning (2012, 236) proposes three criteria for assessing the validity of an as-if random setup: subjects' "information, incentives, and capacities." These criteria, evaluated holistically, indicate that this article's empirical strategy is sound.

First, do subjects anticipate being treated (*information*)? While bureaucrats may see climate disasters as more likely upon assignment to a climate-vulnerable country, they will not have information on the timing of those disasters nor certainty about whether they will experience any such disaster. Likewise, bureaucrats are unlikely to be aware of their future country postings years in advance; it is unclear how such information, even if available, would affect discussions of climate.

Second, are subjects incentivized to sort into or out of treatment groups, or are there incentives to assign subjects to certain groups (*incentives*)? While climate-interested officials may seek posts in climate-vulnerable areas or be more likely to be assigned to such countries, the scarcity of climate experts at the Fund signals that this is unlikely to meaningfully bias our analyses (Laxton, Smith, and Neunuebel 2022). This is confirmed by a pair of tests: prior discussion of climate change does not predict future exposure to climate disasters,[18] and regression results hold when excluding bureaucrats associated with climate discussions in their first overseas posting.[19]

Third, are subjects *able to* select into or out of treatment? Or might subjects be strategically assigned

[18]Model estimated via OLS with bureaucrat and year fixed effects and robust standard errors clustered by bureaucrat (outcome: cumulative count of climate disasters in current country posting; explanatory variable: binary indicating mention of climate in prior country posting; $\beta = -3.01$, $p = 0.32$). Though there is evidence of strategic selection of bureaucrats at the World Bank (Limodio 2021), this does not appear to be the case at the IMF.

[19]Immediate mentions of climate may indicate a predisposition to consider climate risks.

to certain treatment conditions (*capacities*)? Staff can indicate preferences for future postings, but the IMF typically moves bureaucrats between regions (e.g., from Asia to Europe) rather than circulating them across nearby countries with similar climate vulnerabilities.[20] While managers can assign staff to more or less climate-vulnerable countries, they cannot anticipate the timing or precise quantity of climate disasters that bureaucrats might eventually experience. Moreover, we find no evidence of strategic rotation of this sort; as previously noted, bureaucrats' climate attentiveness (measured by prior discussion of climate) does not predict their exposure to future climate disasters.

In sum, limits to subjects' information, interests, and capacities indicate that our assumptions of as-if randomization and plausible exogeneity are reasonable. We further construct regression models cognizant of potential inferential challenges. In testing whether bureaucrats learn from observation of local climate disasters, we include bureaucrat fixed effects to hold constant time-invariant characteristics of staff, such as their prior concern for climate change. This resembles a within-subjects experimental design, as we exploit the as-if random timing of bureaucrats' exposure to climate disasters (Druckman et al. 2011). In examining whether learned climate attentiveness persists following rotation, we conduct within-country tests: independent of a country's climate vulnerability,[21] does having a climate-attuned resident representative make discussions of climate more likely in that country's Article IV report?

To test whether bureaucrats learn from local climate disasters, we estimate the following equation at the bureaucrat-year level:

$$\text{Climate attuned}_{it} = \beta \cdot \text{cumulative climate disasters}_{ic(t-1)} + \gamma \cdot \mathbf{X}_{c(t-1)} + \zeta_i + \eta_t + \epsilon_{it}$$

where *climate attuned*$_{it}$ is a binary indicator of whether bureaucrat *i* had mentioned climate in any Article IV report through year *t*. The primary explanatory variable is the cumulative number of climate disasters experienced by bureaucrat *i* while on assignment in country *c*. $\mathbf{X}_{c(t\text{-}1)}$ is a vector of country-year covariates. ζ_i is a bureaucrat fixed effects term and η_t is a year fixed effects term. ϵ_{it} is a robust error term clustered at the country and bureaucrat levels.

To test for the stickiness of learned climate concerns, we estimate the following at the country-year level:

$$\text{Climate mention}_{ct} = \beta \cdot \text{climate-attuned res. rep.}_{c(t-1)} + \gamma \cdot \mathbf{X}_{c(t-1)} + \zeta_c + \eta_t + \epsilon_{ct} \quad (2)$$

where *climate mention*$_{ct}$ represents whether climate change was discussed in country *c*'s Article IV report in year *t* (binary or count). *Climate-attuned res. rep.* $_{c(t\text{-}1)}$ is a binary indicator of whether country *c*'s resident representative is attentive to climate risk. We measure this according to whether that bureaucrat discussed climate change in an Article IV report in any prior country posting (excluding mentions in their current country *c*). $\mathbf{X}_{c(t\text{-}1)}$ is a vector of country–year covariates. ζ_c is a country fixed effects term, and η_t is a year fixed effects term. ϵ_{ct} is a robust error term clustered at the country level.

We estimate both models with and without covariates. The covariate battery includes a country's gross domestic product per capita (World Bank 2018), accounting for the relationship between economic development and climate vulnerability; their Polity score (Jaggers and Gurr 1995), given work associating democracy with attention to climate (Bättig and Bernauer 2009);[22] participation in an ongoing IMF program (Kentikelenis, Stubbs, and King 2016), which may affect local responsiveness to IMF climate initiatives; and ideal point distance from the United States in UN General Assembly votes (Bailey, Strezhnev, and Voeten 2017), per the link between proximity to the United States and treatment by the IMF (Stone 2008). In the test of climate concern diffusion, we additionally control for climate disasters in a given country–year, drawing this data from EM-DAT as per the process described above. We do so to account for contemporaneous drivers of climate attention, to which both on-the-ground bureaucrats and others at the Fund, such as department officials and chief executives, may be responsive.

[20]Conversations with individuals knowledgeable of IMF bureaucrat rotation. This is supported by network analyses of bureaucrat rotation patterns. We compute "communities" of countries within which bureaucrats more frequently rotate; the communities we identify do not clearly map onto geographic regions or correspond to distinct environmental, economic, or political groups (Appendix C, 4–5).

[21]Countries' climate vulnerability can change over time due, for example, to economic development that renders a society more resilient. We control for such time-variant determinants. Vulnerability is also largely a function of relatively static features that determine *exposure* to climate disasters, such as a country's topography (see, e.g., Heltberg and Bonch-Osmolovskiy 2011). While climate tipping points may produce qualitative shifts in climate vulnerability, these remain largely hypothetical (Lenton 2011).

[22]We use the Polity2 variable contained in Polity data, which records levels of democracy with scores ranging from −10 (most autocratic) to +10 (most democratic).

TABLE 1 Experiences of Climate Disasters and Climate Attentiveness

	Climate Attuned	
	Model 1	Model 2
Climate-related disasters in current country	0.005**	0.004*
	(0.001)	(0.002)
Polity		0.001
		(0.006)
GDP per capita (ln)		−0.013
		(0.036)
In IMF program		0.025
		(0.077)
UN ideal point distance		0.030
		(0.066)
N	556	394
Adj. R^2	0.430	0.438

Notes: OLS regressions of binary indicator for whether resident representative ever mentioned climate in an Article IV report on the cumulative number of climate-related disasters in a current country posting. All RHS variables lagged by 1 year. Includes bureaucrat and year fixed effects. Robust standard errors clustered by bureaucrat and country posting.
$^{\dagger}p < 0.1$; $^{*}p < 0.05$; $^{**}p < 0.01$.

Learning from Climate Disasters

We theorize that IMF bureaucrats learn from experiences of local climate disasters, coming to perceive climate change as relevant to the Fund's operations. In tests at the bureaucrat–year level, we regress a binary variable indicating whether a resident representative has ever mentioned climate in an Article IV report on the cumulative number of climate disasters that the bureaucrat encountered in their current country posting (through the prior year). As we limit our analyses to resident representatives who do at some point mention climate, this test gauges the *timing* of when bureaucrats become attuned to climate risks.[23] We estimate these models by ordinary least squares (OLS).[24]

Table 1 indicates that bureaucrats learn about climate risks and their relevance to IMF analyses after experiencing climate disasters in their host country. Estimation of a bivariate model shows that a standard deviation increase in local climate disasters (8.2 disasters) increases the probability of a resident representative first discussing climate change by about 4 percentage points. Similar results are found when conditioning on factors that may affect a country's climate policy and vulnerability or IMF behavior, such as levels of democracy (Bättig and Bernauer 2009) and political proximity to the United States (Stone 2011). In this model, a standard deviation increase in exposure to climate disasters increases the likelihood of becoming climate attuned by over 3 percentage points.

Might these results owe not to bureaucrat learning but to pressure to discuss climate from elsewhere at the Fund? Managing directors, who have substantial sway over policymaking (Copelovitch and Rickard 2021), may seek such discussions of climate. We account for this alternative explanation in two ways. First, we introduce managing director fixed effects to account for individual-level differences in their climate interest. The results are consistent. Second, we note that managing directors may have taken a special interest in climate change in select countries, such as small island states. This is especially likely to have occurred under Lagarde, the managing director from 2011 to 2019, who helped introduce climate into the Fund's operations (Martinez-Diaz 2017).[25] To account for this, we reestimate these models after dropping from the sample countries where climate had previously been discussed in an Article IV report under Lagarde. These are countries in which Lagarde may have had a distinct interest in climate and pressured bureaucrats accordingly. The results again hold. Appendix F details these tests.

Another possibility is that bureaucrats did not learn from their personal experiences of climate damages but rather from colleagues within the Fund. Such intra-Fund learning is plausible and not in conflict with this article's theory. To distinguish these two mechanisms empirically, we control for the stock of climate-relevant IMF working papers available to staff at any given time. Independent of this accumulated climate knowledge, we continue to find that staff become more likely to first discuss climate in the wake of local climate disasters (Appendix G, 8).

We next consider the possibility that these results are a byproduct of directives from powerful member states, which can intervene in Fund activities (Stone 2011). Broad interventions are unlikely given the divisions in principal preferences over climate, as noted above (Copelovitch 2010a). Nevertheless, to address this empirically, we approximate principals' interest in

[23]Officials receive a 0 if they have never mentioned climate or a 1 if they discussed it at least once in a current or prior posting.

[24]The results are robust to a logit specification (Appendix D, 5) and to clustering standard errors solely by country (Appendix E, 6).

[25]Georgieva, Lagarde's successor, has similarly emphasized climate, but this article's sample ends prior to her tenure.

climate policymaking. We do so by calculating the number of climate-related policies instituted domestically in each of the Fund's largest shareholders.[26] The results are robust to controlling for the total count of such policies, count of policies enacted by each country's executive, and counts weighted by each country's vote share at the IMF (Appendix H, 9).

We lastly consider whether bureaucrats predisposed to discuss climate select into countries that subsequently experience climate disasters. As noted above, bureaucrats' information, incentives, and capacity plausibly limit selection of this sort, as does the historical lack of climate experts at the Fund. Nevertheless, to address potential selection, we identify the bureaucrats who mention climate in their first year posted abroad; to the extent that climate-attuned bureaucrats select into overseas rotations, such bureaucrats are likely to discuss climate early in their tenures. Of our sample, 12 percent of bureaucrats fall into this category. The results are robust to excluding these bureaucrats from the analysis (Appendix I, 10). Across these tests, we consistently find that the observation of local climate damages induces bureaucrats to first consider climate in their economic analyses.[27]

Spread of Climate Attention

Do staff carry learned climate concerns with them as they rotate between countries? We theorize that these lessons are sticky, reshaping bureaucrats' conception of the Fund's mandate and views of the relevance of climate change. To test this, we regress climate mentions in a country's Article IV report for a given year on whether that country is hosting a climate-attuned resident representative. We record climate attentiveness as a binary indicator of whether a bureaucrat had previously discussed climate while assigned to another country, taking these prior mentions to denote bureaucrat recognition of climate's economic importance and pertinence to IMF analyses.[28] These models include country and year fixed effects to account for country- and time-specific factors that may affect climate discussions, such as aspects of a country's physical climate vulnerability.[29] We estimate these models by OLS.[30]

Table 2 shows that having a climate-attuned resident representative is a powerful predictor of climate discussions in Article IV reports. When a country is sent such a bureaucrat, that country's report is rendered 10–14% more likely to include climate mentions. This is a substantively large increase, nearly doubling the baseline rate of climate discussions—16% of reports mentioned climate between 2010 and 2018.[31] This also exceeds the increased probability that results from a recent climate disaster. These results suggest that once a bureaucrat has become attentive to climate risks, that bureaucrat is likely to continue considering climate in their economic analyses even after rotation to countries where climate risks, while still present, are less immediate. Accordingly, the stickiness of these climate lessons helps explain the rapid diffusion of climate discussions across IMF member states documented in Figures 1–2.

Alternative explanations for these findings again include instruction from managing directors, intra-staff learning, and member state intervention. To address the first, we reestimate these models with managing director fixed effects as well as with country–managing director fixed effects to account for the possibility of managing directors prioritizing climate in specific countries (Appendix L, 12). Moreover, we account for potential temporal dependence in climate mentions, a possible artifact of sustained managing director involvement in specific countries, by incorporating lagged dependent variables (Appendix M, 12). To address the second explanation, we control for the stock of climate-relevant IMF working papers available to bureaucrats (Appendix N, 13). To account for the final explanation, we control for measures of climate policymaking in the Fund's largest shareholders to approximate their interest in investing in climate action (Appendix O, 14–15).

[26]We focus on the six largest states by vote share—Britain, China, France, Germany, Japan, and the United States—given their distinct sway at the Fund (Copelovitch 2010a; Kaya 2015; Stone 2011). We collect these data from the Grantham Research Institute on Climate Change and the Environment and Sabin Center for Climate Change Law (2022).

[27]Climate discussions appear to be slightly additive, as opposed to simple substitutes for discussions of other topics. Regressing report word count on the number of climate mentions, we find that an additional climate mention corresponds to a report being 306 words longer (1% of the mean report length; $p = 0.017$).

[28]Validating this measure, we find that while there is a significant relationship between bureaucrats' prior exposure to climate disasters and future mentions, it is principally mediated by bureaucrats' prior *discussions* of climate (Appendix J, 10).

[29]As noted above, climate vulnerability may change over time as a result of economic development. We control for these time-variant factors.

[30]Results are robust to respecification in Poisson and binomial logit formats (Appendix K, 11).

[31]Among bureaucrats who discussed climate previously (climate-attuned bureaucrats), we do not find that the quantity of prior mentions corresponds to more future mentions.

TABLE 2 Bureaucrat Rotation and Persistence of Climate Attentiveness

	Number of Climate Mentions		Any Climate Mentions	
	Model 1	Model 2	Model 3	Model 4
Prior bureaucrat climate mentions (other countries)	2.574** (0.866)	1.480* (0.617)	0.096* (0.047)	0.135* (0.060)
Polity		−0.028 (0.028)		−0.005 (0.004)
GDP per capita (ln)		−0.128 (0.460)		0.059 (0.053)
Climate-related disaster		0.088 (0.067)		0.015* (0.006)
In IMF program		0.320 (0.200)		0.016 (0.023)
UN ideal point distance		−0.063 (0.268)		−0.002 (0.040)
N	1,474	1,151	1,474	1,151
Adj. R^2	0.165	0.180	0.169	0.172

Notes: OLS regressions of the number of climate mentions (Models 1−2) or binary indicator of any climate mention (3−4) in a country's Article IV report on a binary measure of prior climate mentions by that country's resident representative while stationed in other countries (climate attentiveness). Includes country and year fixed effects. Robust standard errors clustered at country level.
$^{\dagger}p < 0.1$; $^{*}p < 0.05$; $^{**}p < 0.01$.

To address potential selection issues, we additionally reestimate these models after excluding country–years associated with resident representatives who discussed climate in their first year assigned abroad (Appendix P, 16). The results are consistent across all cases: climate-attuned bureaucrats continue to introduce climate into IMF analyses after rotation to new countries, independent of the immediacy of climate risks in those new countries.

Interviews

To complement these quantitative hypothesis tests, we conduct semi-structured interviews with several IMF staff. Interviewees include officials previously deployed to small island states, where the theorized learning mechanism was likely to operate, and staff currently working on climate at the Fund. These officials, listed in Table 3, constitute a convenience sample; we selected these interviewees due to their experiences in climate-vulnerable states and experience in climate-related roles. We asked officials to describe why they believe the IMF has become more concerned about climate issues in recent years. The officials indicated that the theorized mechanisms resonated: interviewees initially became aware of climate risks when assigned to particularly climate-vulnerable states and then carried these climate concerns forward. The interviewees also indicated that top-down initiatives from the Fund's highest ranks have been limited.

A current senior official at the Fund recounted his learning about climate impacts while serving as a mission

TABLE 3 List of Interviews with IMF Staff

Interviewee	Date
Senior official and former mission chief to small island state	June 7, 2021
Former senior official	June 8, 2021
Official, Monetary and Capital Markets Department	July 28, 2021
Official, Monetary and Capital Markets Department	July 28, 2021
Official, Monetary and Capital Markets Department	July 28, 2021

Notes: All interviews conducted via video conference.

chief to a small island country in 2001.[32] Standing on a bridge over water, he was told by a financial regulator that the bridge marked the highest point on the island despite being just a few feet above sea level. In this country, the official came to see climate as within the IMF's remit and subsequently became one of the first staff members to discuss climate risks in a Fund report. He has remained attentive to climate risks in the years since, noting that climate is increasingly a "macro-critical issue, and not just for small island countries." Now in a senior role at the Fund, the official indicated that he plays an active part in deliberations over the development of an IMF lending facility to help vulnerable countries bolster their climate resilience.

Notably, the interviews point to a historical lack of coordinated, top-down efforts on climate at the IMF as well as disagreement on the issue at the Fund's upper levels.[33] Corroborating the account of the senior official, staff members indicated that the Fund's attention to climate originated in small, highly vulnerable countries before transforming into more centralized initiatives. "We have been looking into climate issues for many years," one official noted, "but not in an organized way until recently." This official added that the Fund's emphasis on climate did not come from its board, which he described as still "converging" to the view that climate ought to be a priority.[34] Highlighting this division in the Fund's upper ranks, one interviewee, who until recently held a senior position at the Fund, explicitly described climate as being "outside of the IMF's mandate." "The next economic crisis is totally independent of how these issues are handled," he added, and the Fund should accordingly remain focused on traditional balance-of-payments issues.[35] Rather than simply receiving instruction from executives and state representatives, interviewees indicated that mid-level bureaucrats are taking the initiative, actively communicating findings on climate to "colleagues on the board."[36]

Conclusion

Staff learning and rotation help explain the IMF's rapid pivot to prioritize climate. The bottom-up model we put forth complements prominent top-down accounts of IO reform and policymaking (Nielson and Tierney 2003; Stone 2011), as well as theories that emphasize exogenous sources of institutional change (Gerschewski 2021). We contend that mid- and low-level bureaucrats' experiences in the field, in conjunction with anodyne systems of staff rotation, can prompt IOs to quickly expand their focus on emergent governance challenges. This bureaucrat-driven process, while perhaps enabled by permissive managing directors and divided principals, occurs independently of any directives from these executives or member states.

This argument builds on work describing how IO bureaucracies operate under the watch of powerful principal states, underscoring the importance of staff situated below the upper echelons of their institution (Barnett and Finnemore 1999; Clark and Dolan 2021). It further advances nascent scholarship on climate risks and the burgeoning body of literature on global climate governance (e.g., Colgan, Green, and Hale 2021; Graham and Serdaru 2020). This research has largely focused on the role played by IOs whose formal mandates encompass climate change. In contrast, we illustrate how and why institutions established for non-climate purposes are retrofitting themselves for an era of climate disruption.

We develop and test this theory in reference to the IMF but expect that it can be generalized to apply to other institutions, both domestic and international, that deploy and rotate staff abroad, such as domestic aid agencies, ministries of foreign affairs, and militaries (Malis 2021). Many other IOs also oversee bureaucrats deployed abroad, including those involved in peacekeeping, election monitoring, and development finance. In each of these cases, bureaucrats enjoy some slack stemming from limited principal oversight (Autesserre 2014; Honig 2018; Woods 2007), leaving room for staff to learn and rethink which issues are germane to their institution's mandate.

The IMF may be a hard case for a theory of staff learning and rotation. The Fund deploys relatively few staff overseas in comparison to other institutions, like the World Bank, which may limit opportunities for climate information to filter upwards through the organization. Scholars might explore how bureaucratic structures, or differences in managerial or principal oversight, mediate the influence of bottom-up learning and the speed with which institutions pivot to novel challenges, including climate change but also issues such as COVID-19 and cryptocurrencies. In exploring these extensions, scholars might also consider whether the effects of experiential learning weaken as issues mature and are embraced by more institutions.

[32] Interview 1 (June 7, 2021).

[33] Interviews 3–5 (July 28, 2021).

[34] Interviews 3–5 (July 28, 2021).

[35] Interview 2 (June 8, 2021).

[36] Interviews 3–5 (July 28, 2021).

This article has important implications for policy makers and scholars of climate change. Its theory emphasizes the importance of bureaucrats learning from direct observation of climate impacts. It is possible, however, that staff are also influenced by social interactions in the host country, including the persuasive efforts of politicians, civil society groups, businesses, and other international bureaucrats in the area. Future work might disentangle the effect of learning from that of this sort of socialization on institutional change. Prior accounts have largely examined how IOs socialize states (Checkel 2003; Greenhill 2010; Johnston 2008). This article suggests that states may also socialize IO staff, initiating a process of norm diffusion as staff move within their institution.

We lastly document an important pathway by which existing institutions incorporate climate change into their operations. Scholars might delve into these institutional changes from the perspectives of developing countries, where we suggest the IMF's climate attentiveness largely originates. Researchers have described the efforts of developing countries in formal, interstate climate negotiations (e.g., Sengupta 2011). Our findings suggest that engagement with international bureaucrats may be an alternative means by which these states can advance their interests in the climate domain. Subsequent work might consider how climate-vulnerable states strategically approach these interactions with IOs. Alongside high-profile international negotiations, the commonplace operations of established institutions may be meaningfully shifting the trajectory of global climate governance.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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