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Weathering the Vote: How Temperature Extremes Shape Political Participation in India

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Abstract

We examine the causal impact of polling day temperature on voter turnout and electoral outcomes using comprehensive data from Indian state assembly elections. Exploiting plausibly exogenous variation in temperature deviations from historical norms on every polling day across elections from 1976 to 2023, we find that higher temperatures significantly increase voter turnout, with strongly non-linear effects. Temperature deviations exceeding 2°C above normal increase aggregate turnout by 0.8 percentage points. These effects exhibit important heterogeneity: female turnout responds more strongly to temperature variations than male turnout (0.83 vs 0.67 percentage points), and responses vary dramatically by long-term climatic conditions. In the coolest regions, warm deviations boost turnout by 1.5 percentage points, while in the hottest regions, the same deviations reduce turnout by 0.6 percentage points. Temperature also affects electoral competition—deviations above 2°C increase victory margins by nearly 1 percentage point. As climate change accelerates, these findings reveal how environmental factors may reshape democratic participation, with implications for electoral representation and policy outcomes in the world's largest democracy.

Keywords: Voter turnout, temperature, elections, climate change, political participation, gender gap, India, environmental shocks

1 Introduction

Severe weather events are becoming increasingly common due to climate change and can severely impair individuals' economic decisions and outcomes. These events may disproportionately affect vulnerable populations, including women, children, and poorer households (IPCC, 2022). While an extensive literature has examined the impacts of extreme temperatures on agricultural incomes (Blakeslee and Fishman, 2018; Burgess et al., 2014), human capital accumulation (Shah and Steinberg, 2017; Garg et al., 2020b), conflict and crime (Burke et al., 2015; Colmer, 2021), workplace safety (Park et al., 2021), and structural transformation (Liu et al., 2023), the effects of temperature on political participation remain understudied, particularly in developing countries where climate vulnerability is high.

This paper investigates how polling day temperature affects voter turnout and electoral outcomes in Indian state assembly elections. India provides an ideal laboratory for this analysis. As the world's largest democracy with over 900 million eligible voters, elections occur throughout the year across diverse climatic zones— from the Himalayan regions to tropical coastal areas— providing substantial variation in temperature exposure. Moreover, as a developing country experiencing rapid climate change, understanding temperature-turnout relationships in India offers critical insights for other vulnerable democracies.

We compile a comprehensive dataset covering elections from 1976 to 2023, combining detailed electoral data with high-resolution temperature measurements during polling hours (7:30-17:30). Our identification strategy exploits plausibly exogenous variation in temperature deviations from historical norms[1], controlling for constituency, year, month, and day-of-year fixed effects. This approach isolates the impact of unexpected temperature variations from seasonal patterns, long-term trends, and location-specific characteristics.

Our analysis yields four main findings. First, temperature has robust non-linear effects on turnout. Using a quadratic specification, we find an inverted U-shape relationship with turnout maximizing between 44-53°C depending on the outcome. Temperature deviations above 2°C from normal increase aggregate turnout by 0.8 percentage points (1.2% relative to mean turnout)— effects comparable to established voter mobilization interventions.

Second, we document significant gender heterogeneity. Female voters respond more strongly to temperature variations, with warm deviations (>2°C) increasing female

[1] We measure the 30-year normal temperature for all polling days and calculate deviations from this for all polling dates.

turnout by 0.83 percentage points versus 0.67 for males. This differential response may reflect eased constraints on women's mobility—hotter days often reduce fieldwork responsibilities, especially in agriculture, freeing up time to vote. Alternatively, women may be more responsive to exceptional conditions or attach greater salience to the act of voting under such circumstances. These patterns are consistent with evidence that women's political behavior is more sensitive to contextual barriers and household labor dynamics.

Third, climatic conditions critically moderate temperature effects. Constituencies in the coolest quartile show strong positive responses to warming (1.5 percentage point increase for >2°C deviations), while the hottest quartile exhibits negative responses (-0.6 percentage points). This suggests important adaptation margins— populations accustomed to heat may reach physiological or infrastructure limits where additional warming reduces participation.

Fourth, temperature affects electoral competition. Victory margins increase by 0.99 percentage points when temperatures exceed 2°C above normal, indicating that differential turnout responses across voter groups translate into meaningful electoral consequences. These effects are stronger in competitive elections and unreserved constituencies, suggesting complex interactions between environmental conditions and political institutions.

Our findings contribute to multiple literatures. We extend research on environmental determinants of political behavior beyond developed country contexts (Gomez et al., 2007; Fujiwara et al., 2016) to a major developing democracy. We provide new evidence on gender gaps in political participation, showing how environmental factors may exacerbate or mitigate persistent disparities (Cohen and Dechezleprêtre, 2022). Finally, we inform debates about climate change and democratic quality by demonstrating how rising temperatures may reshape electoral participation and competition.

The remainder of this paper proceeds as follows. Section 2 reviews related literature. Section 3 describes India's electoral institutions. Section 4 presents our data. Section 5 outlines the empirical strategy. Section 6 reports main results. Section 7 examines heterogeneous effects. Section 8 discusses the next steps. Section 9 concludes and explores policy implications.

2 Related Literature

2.1 Weather and Political Participation

Research on the impact of weather on political participation has shows suppressed turnout from inclement weather, primarily from developed countries. In the United States, Gomez et al. (2007) find that rainfall reduces turnout by about 1% per inch, disproportionately affecting peripheral voters. Fujiwara et al. (2016) document habit formation in voting using rainfall variation, while Van Assche et al. (2017) show heat reduces turnout in US Presidential elections. However, evidence from developing countries remains limited despite potentially greater vulnerability to weather shocks. Our paper advances this literature in three ways. First, we examine temperature rather than precipitation in a tropical developing country context where heat stress may be more salient. Second, we leverage within-location variation in temperature deviations rather than cross-sectional weather differences, strengthening causal identification. Third, we explore extensive heterogeneity across gender, geography, and institutional contexts unavailable in most existing studies.

2.2 Gender and Political Participation

Persistent gender gaps in political participation exist globally, particularly in developing countries (Desposato and Norrander, 2009). In India, despite constitutional equality and targeted policies, women's political participation lags men's, though the gap has narrowed over time (Prillaman, 2023). Factors explaining this gap include household responsibilities, mobility constraints, safety concerns, and traditional gender norms (Anukriti et al., 2020). Environmental shocks may differentially affect women's political participation through multiple channels. Time use studies show women bear disproportionate burdens during weather extremes through increased domestic work (Garg et al., 2020a). Patriarchal norms often restrict women's mobility, potentially making them more sensitive to weather conditions when traveling to vote. Our analysis provides the first systematic evidence on how temperature affects gender gaps in turnout.

2.3 Climate Change and Institutions

Growing literature examines how climate affects institutional quality and governance. Dell et al. (2012) show temperature shocks reduce economic growth more in poor countries with weak institutions. Burke et al. (2015) find temperature increases conflict risk. However, little work examines climate impacts on democratic processes themselves. Our findings suggest climate change may affect democracy through the participation channel. If rising temperatures systematically alter who votes, this could reshape policy outcomes through median voter effects (Downs, 1957). The heterogeneous impacts we document— by gender, geography, and competitiveness— imply climate change's political consequences may be as important as economic impacts.

3 Institutional Context

3.1 Indian Electoral System

India's parliamentary democracy includes elections at national (Lok Sabha), state (Vidhan Sabha), and local (Panchayat) levels. Our analysis focuses on state assembly elections, which elect representatives to state legislative assemblies that form state governments. States have considerable autonomy over development policy, making these elections consequential for citizens' welfare. State assemblies range from 30 to 403 seats depending on population. Elections use first-past-the-post voting in single-member constituencies. The party or coalition winning a majority forms the government, with the chief minister as executive head. Elections occur every five years unless assemblies are dissolved earlier.

3.2 Electoral Administration

The Election Commission of India (ECI), an autonomous constitutional authority, administers all elections. The ECI maintains strict protocols ensuring free and fair elections, including model codes of conduct, expenditure limits, and deployment of security forces. Voting occurs through electronic voting machines (EVMs) at designated polling stations, typically schools or government buildings. Polling generally occurs from 7:30 AM to 5:30 PM, though timing may vary slightly by state. Elections often occur in phases for security reasons, with different constituencies voting on different dates. This phasing, combined with year-round elections across states facilitate the formulation of a credible empirical strategy based on deviations from temperature norms and ensure that we have sufficient variation within constituencies.

3.3 Reservation System

India's constitution reserves certain constituencies for Scheduled Castes (SCs) and Scheduled Tribes (STs) to ensure representation for historically disadvantaged groups. Only members of these communities can contest from reserved constituencies, though all registered voters participate. Approximately 23% of constituencies are reserved, proportional to SC/ST population shares. This institutional feature allows us to examine whether temperature effects vary by reservation status.

4 Data

4.1 Electoral Data

We compile constituency-level electoral data from the Election Commission of India covering state assembly elections. Our dataset spans 36,771 constituency-election observations across major states. The key variables in the dataset include total turnout, gender-specific turnout, victory margins, electoral competition, and reservation status.

Turnout is measured as the total votes cast as a percentage of registered electors, ranging from 1 to 100. Gender-specific turnout is computed separately for male and female voters. Victory margin captures the difference between the winner's and runner-up's vote share. Electoral competition is measured as the lifetime likelihood of having more than 3 parties in the election. Reservation status indicates whether a constituency is reserved for Scheduled Caste (SC) or Scheduled Tribe (ST) candidates.

Mean turnout is 66.9 percent, with male turnout (69.2 percent) exceeding female turnout (64.1 percent) by 5.0 percentage points. The average victory margin is 13.6 percent, with substantial variation in competitiveness across constituencies.

4.2 Temperature Data

Temperature data come from ERA5-Land, the fifth-generation ECMWF atmospheric reanalysis, which provides hourly temperature at a spatial resolution of 0.25° (approximately 31 km). For each constituency-election, we calculate the average temperature during polling hours (7:30–17:30) by first mapping ERA5-Land grid cells to constituency polygons, then computing the area-weighted overlap between grids and constituencies, and finally calculating the weighted average temperature across overlapping cells.

To construct temperature deviations, we compute location and date-specific historical hourly means using 30-year data and take the average for the polling hours. This procedure captures the typical temperature for each location–date combination, allowing us to identify unusual temperature realizations.

4.3 Sample Characteristics

Figure 1 shows the distribution of elections across months. Figures 2-4 present temperature distributions, both in levels and deviations from normal.

5 Empirical Strategy

5.1 Main Specifications

We employ two complementary approaches to estimate temperature effects on electoral outcomes.

5.1.1 Quadratic Specification

Our first approach models non-linear temperature effects using a quadratic function:

$$\text{Turnout}_{it} = \beta_1 \cdot \text{Temp}_{it} + \beta_2 \cdot \text{Temp}_{it}^2 + \gamma \cdot \text{NormalTemp}_{it} + \alpha_i + \delta_t + \mu_m + \theta_d + \varepsilon_{it} \quad (1)$$

where Turnout_{it} measures voter turnout in constituency i in year t; Temp_{it} is average polling-day temperature; NormalTemp_{it} is historical mean temperature for that location-date; α_i are constituency fixed effects; δ_t are year fixed effects; μ_m are month fixed effects; θ_d are calendar day-of-year fixed effects. Standard errors are clustered at the constituency level.

5.1.2 Temperature Deviation Bins

To flexibly capture non-linearities, we also estimate:

$$\text{Turnout}_{it} = \sum_k \beta_k \cdot \not{\Vdash}[\text{TempDev}_{it} \in \text{Bin}_k] + \gamma \cdot \text{NormalTemp}_{it} + \alpha_i + \delta_t + \mu_m + \theta_d + \varepsilon_{it} \quad (2)$$

where TempDev_{it} represents deviation between actual and historical temperature, categorized into bins: < -2°C, -2 to -1°C, -1 to 0°C (omitted category), 0 to 1°C, 1 to 2°C, > 2°C.

Our identification exploits within-constituency variation in temperature deviations from historical norms. The rich fixed effects structure absorbs time-invariant constituency characteristics such as geography, infrastructure, and political culture through α_i, common temporal shocks such as national politics and economic conditions through δ_t, and seasonal patterns through μ_m and θ_d. Identifying variation therefore comes from unusual temperature realizations relative to what is typical for that specific location–date combination. For example, a constituency that normally experiences 25°C on March 15th but faces 30°C provides identifying variation.

5.2 Threats to Identification

The key identifying assumption is that temperature deviations are orthogonal to unobserved determinants of turnout after conditioning on our fixed effects. Several factors support this assumption. First, short-term temperature fluctuations around historical norms are plausibly random with respect to political factors, providing plausible exogeneity. Second, our specification includes rich controls that account for location-specific, temporal, and seasonal factors. Finally, the sample is balanced since elections occur year-round across diverse locations, which limits concerns about systematic selection.

6 Main Results

6.1 Quadratic Temperature Effects

Table 1 presents results from the quadratic specification. Column 1 shows temperature has significant non-linear effects on aggregate turnout. The positive linear coefficient (0.303, p<0.01) and negative quadratic coefficient (-0.003, p<0.10) confirm an inverted U-shape relationship. Turnout maximizes at 53.0°C, well above observed temperatures, implying positive marginal effects throughout our sample range.

At mean temperature (26.8°C), a 1°C increase raises turnout by 0.14 percentage points. This effect is economically meaningful—a one standard deviation temperature increase (4.5°C) raises turnout by 0.6 percentage points, comparable to get-out-the-vote campaigns.

Columns 2-3 examine gender-specific turnout. Male turnout shows stronger quadratic effects, maximizing at 44.0°C. Female turnout exhibits weaker non-linearity, with maximum at 114.9°C (effectively linear in our range). Column 4 reveals temperature significantly affects the gender gap— higher temperatures reduce male-female turnout differentials.

6.2 Temperature Deviation Effects

Table 2 presents results using temperature deviation bins, offering more flexible functional forms, on various measures of turnout. The effects strengthen monotonically with positive deviations. Relative to the –1 to 0°C reference category, 0 to 1°C deviations increase turnout by 0.28 percentage points ($p < 0.05$), 1 to 2°C deviations increase turnout by 0.60 percentage points ($p < 0.01$), and deviations above 2°C increase turnout by 0.80 percentage points ($p < 0.01$). Gender-specific results reveal important heterogeneity. Female turnout responds more strongly to extreme warm deviations (>2), rising by 0.83 percentage points, compared to 0.67 percentage points for male turnout. Cold deviations (1<2 to <2) significantly reduce the gender gap, while warm deviations show mixed effects.

Next, Table 3 examines the impacts of temperature deviations on victory margins and shows that electoral outcomes are significantly affected. Relative to normal conditions, 0 to 1°C deviations increase margins by 0.76 percentage points ($p < 0.01$), 1 to 2°C deviations increase margins by 0.51 percentage points ($p < 0.05$), and deviations above 2°C increase margins by 0.99 percentage points ($p < 0.01$). These effects are substantial, amounting to a 7.3 percent increase relative to the mean victory margin. The results suggest that temperature-induced turnout changes systematically favor certain candidates or parties, potentially those whose supporters are less affected by weather conditions.

Figure 5 visualizes these relationships, plotting coefficients with 95% confidence intervals. The clear positive gradient for warm deviations and relatively flat profile for cold deviations suggest asymmetric temperature effects.

7 Heterogeneous Effects

7.1 Long term climatic conditions

We examine heterogeneity based on constituencies' climate by dividing the sample into quartiles of historical average temperature. Tables 4 to 7 present results. Striking patterns emerge. In the coolest quartile (Q1, mean temperature 20.4°C), warm deviations strongly increase turnout—by 1.5 percentage points for >2°C deviations. Effects remain positive but attenuate moving to warmer quartiles. In the hottest quartile (Q4, mean 31.2°C), warm deviations reduce turnout by 0.6 percentage points. Figure 8 visualizes these patterns. The gradient from positive to negative effects across quartiles suggests important adaptation and physiological limits. Populations unaccustomed to heat benefit from warming (perhaps through increased comfort and mobility), while those in already-hot climates suffer when temperatures exceed coping thresholds. Gender patterns also vary by long term temperature. In cool regions, temperature primarily affects the gender gap through differential male responses. In hot regions, both genders show similar negative responses to additional warming.

7.2 Reservation status

Tables 8–12 compare the effects between reserved and unreserved constituencies. Temperature effects are concentrated in unreserved constituencies, where deviations above 2°C increase turnout by 1.0 percentage point ($p < 0.01$), while reserved constituencies show no significant responses. Several mechanisms could explain this heterogeneity. Reserved constituencies may experience different competitive dynamics, SC/ST populations may face distinct socioeconomic constraints on voting, and geographic clustering may place reserved constituencies in regions with particular climate adaptations. The gender gap also responds differently by reservation status. In unreserved constituencies, cold deviations reduce the gender gap while warm deviations have mixed effects, whereas reserved constituencies show no significant gender gap responses.

7.3 Long term Electoral Competitiveness

Tables 13-17 examine heterogeneity by electoral competitiveness, measured using effective number of parties (ENOP). We define elections as competitive when ENOP$\geq$3. Competitive elections show stronger temperature responses, particularly for positive deviations. In competitive races, >2°C deviations increase turnout by 0.80 percentage points versus 0.68 in non-competitive races. Female voters show particularly strong responses in competitive elections (0.76 vs 0.76 percentage points).

Victory margins respond differently by competitiveness. In non-competitive elections, temperature increases margins substantially (1.6 percentage points for >2°C). In competitive elections, effects are muted and insignificant, suggesting temperature-induced turnout changes have smaller impacts when multiple viable candidates exist.

8 Next Steps

Building on the evidence presented in previous sections, several avenues remain for deepening our understanding of the mechanisms and strengthening the robustness of the findings.

First, further work is needed to disentangle the relative importance of the different mechanisms through which temperature affects political participation. Physiological and comfort effects appear central, but additional evidence could clarify how these interact with time allocation patterns, gender roles, and infrastructural constraints. In particular, expanding the use of hourly turnout data by gender across more states would allow us to better identify intra-day behavioral responses to temperature shocks. Likewise, systematic data collection on polling station amenities and transportation availability could help establish the role of infrastructure in shaping turnout responses.

Second, ongoing research should explore the information and salience channel in greater depth. This requires linking weather variation to campaign activity, media coverage, and issue salience around elections. Such analysis could help identify whether temperature shocks merely constrain physical participation or also shift the informational environment in ways that influence voter mobilization. Therefore, more granular checks could also assess whether temperature effects vary systematically with urban–rural divides, constituency size, or polling infrastructure density.

Third, we intend to add robustness checks to include placebo outcomes that should not vary with contemporaneous temperature to isolate the turnout narrative (registered voters and candidates, lagged registrations and number of election candidtaes).

Finally, future work could examine whether repeated exposure to temperature shocks leads to long-term adaptation in voter behavior. This could be addressed using panel data across multiple election cycles, tracing whether constituencies in hotter regions gradually attenuate their responses relative to those in cooler regions. Such analysis would shed light on the persistence of the effects documented here and the potential for adaptive capacity in democratic participation under climate stress, to test if an adaptation response is different from or similar to Fujiwara et al. (2016).

9 Conclusion and Policy Implications

Our findings show that temperature systematically shapes electoral participation and competition in India, the world's largest democracy. Warm deviations above 2°C increase turnout by 0.8 percentage points overall, with stronger effects among women and in cooler constituencies, while turnout declines in already hot regions. These effects extend to electoral competition: winning margins widen by nearly 1 percentage point under warmer conditions, suggesting that temperature-induced turnout changes systematically favor certain candidates or parties. Such results highlight how climate stress can alter patterns of democratic engagement, with potentially far-reaching consequences for representation and governance. These patterns carry important policy implications. Election commissions could reduce weather-driven distortions by incorporating forecasts into scheduling decisions, especially in phased elections where differential exposure to extreme temperatures could advantage particular regions or parties. Investments in polling station infrastructure—such as shade, cooling systems, and drinking water—would further mitigate adverse impacts. Priorities include hot climate regions where warming reduces turnout, reserved constituencies where muted responses may reflect infrastructure gaps, and rural areas where transportation constraints heighten vulnerability. Targeted interventions, including extended polling hours, mobile polling stations, transportation assistance, and public information campaigns, could facilitate participation. Gender-specific measures, such as ensuring safe transportation for women, are particularly relevant given women's stronger turnout responses to temperature shocks.

Beyond immediate interventions, our results highlight the importance of integrating electoral resilience into broader climate adaptation planning. Long-term measures could include systematic assessments of electoral vulnerability, constitutional or legal provisions for weather-related adjustments to polling procedures, and research on technological innovations such as remote or digital voting. Just as infrastructure, agriculture, and health systems must adapt to climate change, so too must democratic institutions. Taken together, our findings contribute to a growing literature on climate and institutions by demonstrating that environmental shocks affect not only economic outcomes but also the functioning of democracy itself. Moderate warming can facilitate participation, but the heterogeneous effects we document—by gender, geography, and reservation status—raise concerns about inequalities in representation. Temperature-induced changes in victory margins show that even small shifts in turnout can meaningfully alter electoral outcomes, potentially influencing policy directions in areas far removed from climate.

As global temperatures rise and extreme weather events intensify, understanding the environmental determinants of political participation becomes increasingly urgent. The future of democracy in vulnerable regions may depend on adapting political systems to withstand these pressures. Policymakers and electoral authorities must therefore view climate adaptation not only as an economic or environmental imperative but also as a democratic one, essential for ensuring fair and inclusive participation in the decades ahead.

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10 Figures

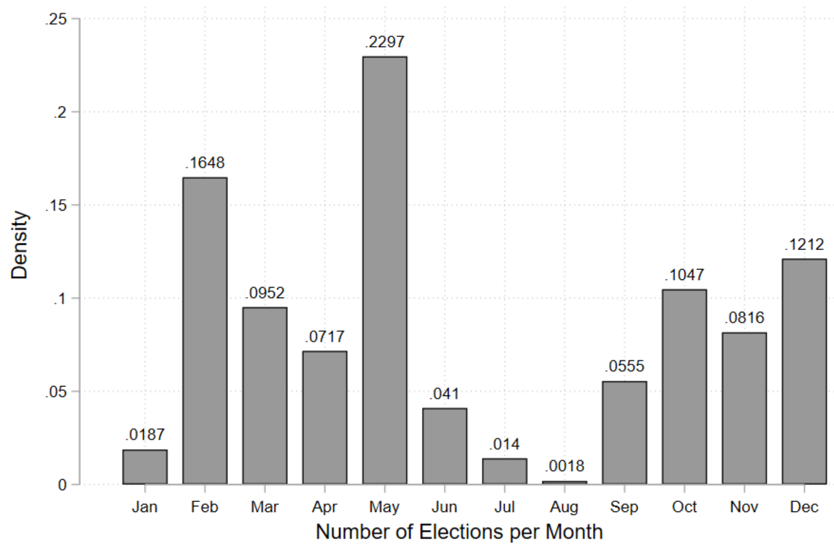


Figure 1: Density of Elections per Month in the Sample Period

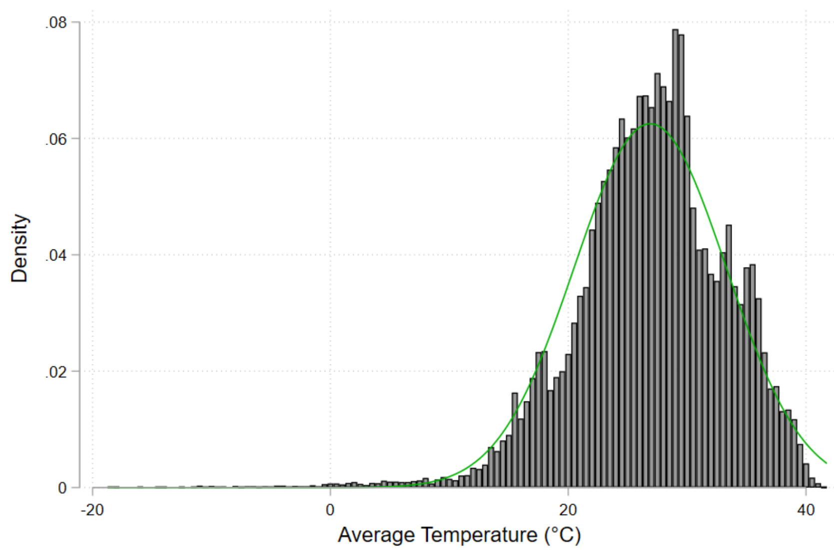


Figure 2: Histogram of Average Temperature (0.5°C bins)

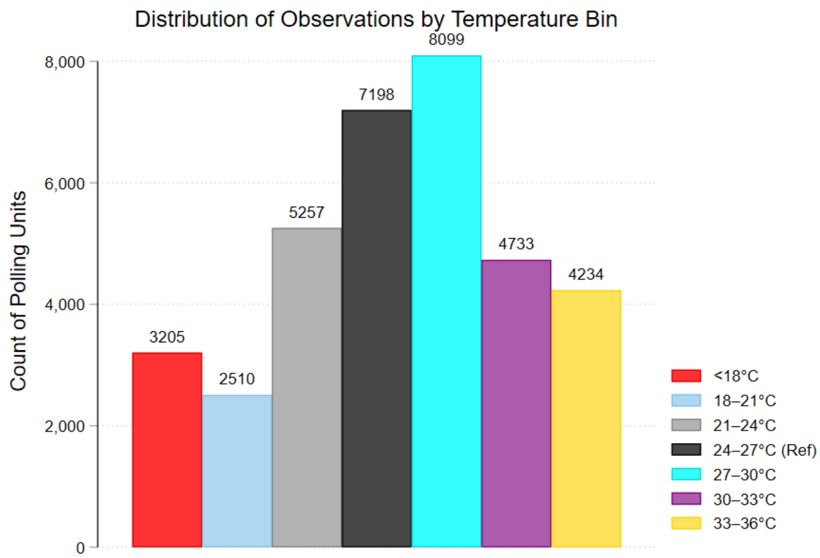


Figure 3: Distribution of Observations by Average Temperature Bin

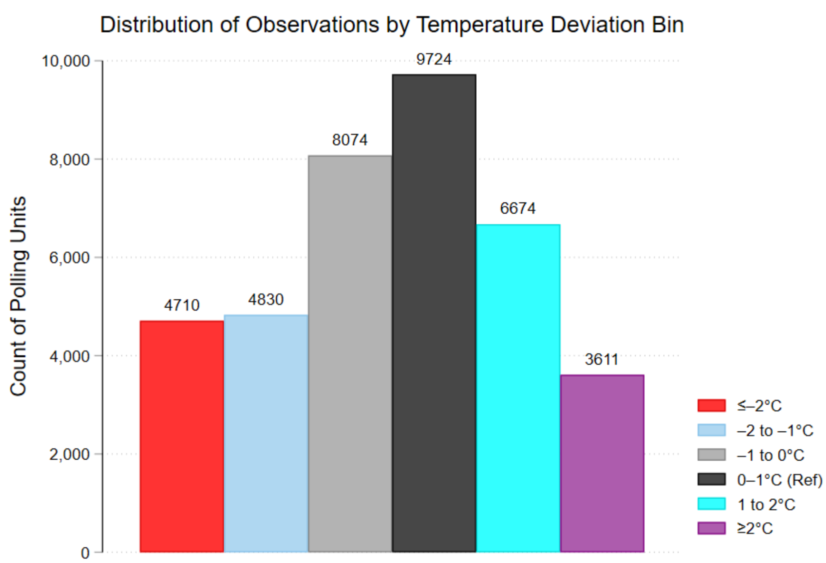
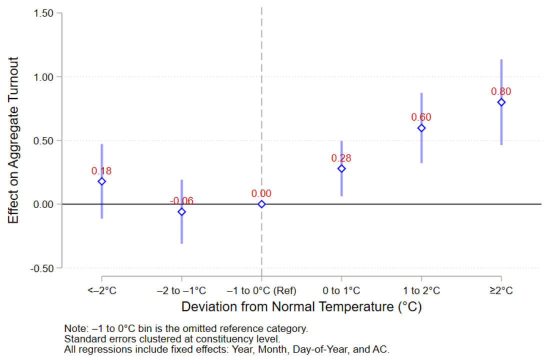
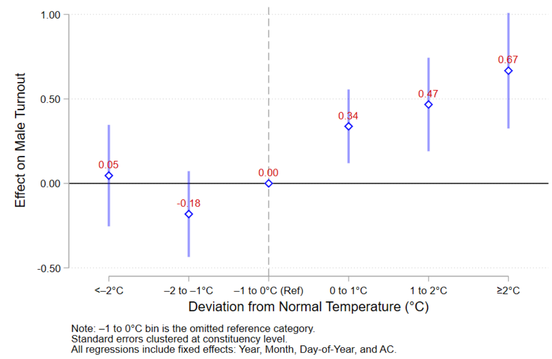


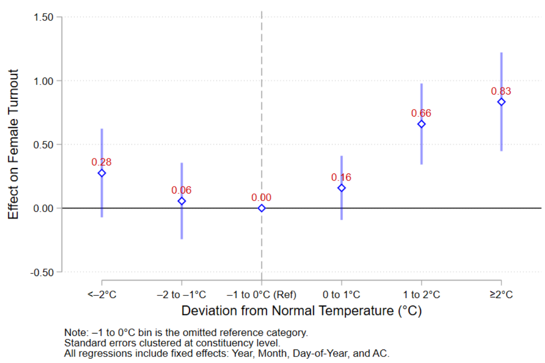
Figure 4: Distribution of Observations by Temperature Deviation Bin



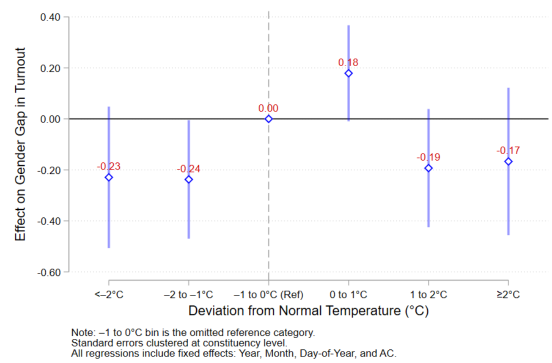
(a) Aggregate Turnout



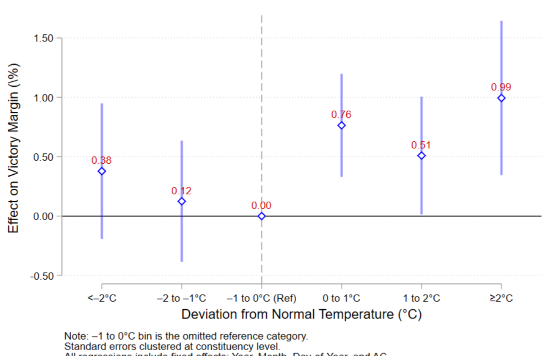
(b) Male Turnout



(c) Female Turnout



(d) Gender Gap in Turnout



(e) Victory Margin (%)

Figure 5: Effect of Polling Day Temperature Deviations on Turnout and Victory Margin

11 Tables

Table 1: Quadratic Impact of Heat on Voter Turnout

	(1) Aggregate	(2) Male	(3) Female	(4) Gender Gap
Avg. Temperature (°C)	0.303***	0.356***	0.202*	0.155**
	(0.090)	(0.089)	(0.104)	(0.068)
Avg. Temperature Squared	-0.003*	-0.004***	-0.001	-0.003***
	(0.001)	(0.001)	(0.002)	(0.001)
Avg. Normal Temp (°C)	-0.503***	-0.487***	-0.523***	0.036
	(0.048)	(0.048)	(0.058)	(0.041)
Mean Outcome (at Avg Temp)	66.93	69.15	64.12	5.03
Turning Point (°C)	53.02	44.02	114.86	24.39
p-value: Quadratic Terms	0.00	0.00	0.00	0.02
Observations	36771	36771	36771	36771

Notes: Estimates are from linear regressions of voter turnout outcomes on a quadratic function of polling day temperature and average normal temperatures. Fixed effects for constituency, year, month, and day-of-year are included in all regressions. *Mean Outcome* is the predicted value of the dependent variable at the sample mean of polling day temperature. The *Turning Point* reports the temperature (in °C) at which the quadratic prediction reaches its maximum or minimum. The p-value tests the joint significance of the linear and squared temperature terms. Standard errors are clustered at the constituency level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Impact of Heat on Voter Turnout

	(1) Aggregate	(2) Male	(3) Female	(4) Gender Gap
T Deviation <-2C	0.178	0.046	0.275	-0.229
	(0.149)	(0.153)	(0.177)	(0.141)
T Deviation -2C to -1C	-0.060	-0.182	0.056	-0.237**
	(0.128)	(0.130)	(0.153)	(0.119)
T Deviation 0C to 1C	0.279**	0.338***	0.159	0.179*
	(0.111)	(0.111)	(0.128)	(0.096)
T Deviation 1C to 2C	0.597***	0.467***	0.660***	-0.193
	(0.141)	(0.141)	(0.162)	(0.118)
T Deviation >2C	0.799***	0.667***	0.834***	-0.167
	(0.172)	(0.174)	(0.197)	(0.147)
Mean Outcome (-1 to 0)	68.70	70.55	66.28	4.26
Fixed Effects:				
Constituency	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Month	Yes	Yes	Yes	Yes
Day of Year	Yes	Yes	Yes	Yes
Observations	36771	36771	36771	36771

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is voter turnout (share of registered voters). All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 3: Impact of Heat on Victory Margin

	(1) Margin of Victory (%)
T Deviation <-2C	0.378
	(0.291)
T Deviation -2C to -1C	0.125
	(0.260)
T Deviation 0C to 1C	0.764***
	(0.221)
T Deviation 1C to 2C	0.510**
	(0.253)
T Deviation >2C	0.994***
	(0.331)
Mean Outcome	13.65
Fixed Effects:	
Constituency	Yes
Year	Yes
Month	Yes
Day of Year	Yes
Observations	35281

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is victory vote share margin of the winner. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 4: Impact of Heat on Male Turnout

	(1) Q1	(2) Q2	(3) Q3	(4) Q4
T Deviation <-2C	-0.272	0.163	0.598**	-0.399
	(0.447)	(0.265)	(0.281)	(0.275)
T Deviation -2C to -1C	-0.611*	-0.152	0.221	-0.318
	(0.365)	(0.225)	(0.208)	(0.236)
T Deviation 0C to 1C	-0.641**	1.195***	0.434**	-0.018
	(0.318)	(0.196)	(0.181)	(0.193)
T Deviation 1C to 2C	0.450	1.190***	1.012***	-0.768***
	(0.427)	(0.247)	(0.217)	(0.218)
T Deviation >2C	1.907***	0.798***	1.198***	-0.668***
	(0.537)	(0.304)	(0.283)	(0.251)
Mean Outcome (-1 to 0)	74.91	67.21	68.72	72.34
Average T (-1 to 0)	20.39	26.48	28.42	31.20
Fixed Effects:				
Constituency	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Month	Yes	Yes	Yes	Yes
Day of Year	Yes	Yes	Yes	Yes
Observations	8047	9485	9230	9052

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the total male voter turnout in percentage. We present subgroup estimates by assigning each constituency to a quartile based on their weighted average temperatures, where Q1 corresponds to the coolest regions and Q4 to the hottest regions. A weighted average temperature is calculated for each constituency by averaging the contemporaneous heat exposure on election day, weighted by the number of electors in that given year. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 5: Impact of Heat on Female Turnout

	(1) Q1	(2) Q2	(3) Q3	(4) Q4
T Deviation $<$-2C	-0.399	0.229	0.894***	0.476
	(0.510)	(0.309)	(0.319)	(0.318)
T Deviation -2C to -1C	-0.600	0.559**	0.257	-0.141
	(0.415)	(0.263)	(0.257)	(0.291)
T Deviation 0C to 1C	-1.230***	1.428***	0.478**	-0.376*
	(0.360)	(0.230)	(0.228)	(0.213)
T Deviation 1C to 2C	-0.920*	2.162***	1.186***	0.043
	(0.473)	(0.293)	(0.266)	(0.249)
T Deviation $>$2C	1.007*	2.100***	1.492***	-0.645**
	(0.569)	(0.364)	(0.327)	(0.312)
Mean Outcome (-1 to 0)	73.02	61.28	63.84	68.03
Average T (-1 to 0)	20.39	26.48	28.42	31.20
Fixed Effects:				
Constituency	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Month	Yes	Yes	Yes	Yes
Day of Year	Yes	Yes	Yes	Yes
Observations	8047	9485	9230	9052

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the total female voter turnout in percentage. We present subgroup estimates by assigning each constituency to a quartile based on their weighted average temperatures, where Q1 corresponds to the coolest regions and Q4 to the hottest regions. A weighted average temperature is calculated for each constituency by averaging the contemporaneous heat exposure on election day, weighted by the number of electors in that given year. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *$p<0.1$ **$p<0.05$ ***$p<0.01$.

Table 6: Impact of Heat on Gender Gap in Turnout

	(1) Q1	(2) Q2	(3) Q3	(4) Q4
T Deviation <-2C	0.127	-0.066	-0.295	-0.875***
	(0.302)	(0.286)	(0.253)	(0.291)
T Deviation -2C to -1C	-0.012	-0.711***	-0.036	-0.176
	(0.259)	(0.240)	(0.213)	(0.231)
T Deviation 0C to 1C	0.589***	-0.232	-0.043	0.358*
	(0.203)	(0.206)	(0.171)	(0.196)
T Deviation 1C to 2C	1.370***	-0.972***	-0.174	-0.811***
	(0.262)	(0.255)	(0.216)	(0.218)
T Deviation >2C	0.900***	-1.302***	-0.294	-0.023
	(0.341)	(0.312)	(0.262)	(0.264)
Mean Outcome (-1 to 0)	1.89	5.93	4.88	4.32
Average T (-1 to 0)	20.39	26.48	28.42	31.20
Fixed Effects:				
Constituency	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Month	Yes	Yes	Yes	Yes
Day of Year	Yes	Yes	Yes	Yes
Observations	8047	9485	9230	9052

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the gender gap in voter turnout in numbers. We present subgroup estimates by assigning each constituency to a quartile based on their weighted average temperatures, where Q1 corresponds to the coolest regions and Q4 to the hottest regions. A weighted average temperature is calculated for each constituency by averaging the contemporaneous heat exposure on election day, weighted by the number of electors in that given year. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 7: Impact of Heat on Victory Margin (%)

	(1) Q1	(2) Q2	(3) Q3	(4) Q4
T Deviation <-2C	-0.561	-0.296	0.979*	0.964*
	(0.697)	(0.538)	(0.581)	(0.541)
T Deviation -2C to -1C	0.274	0.033	-0.370	0.470
	(0.620)	(0.457)	(0.530)	(0.492)
T Deviation 0C to 1C	0.144	0.183	1.268***	1.493***
	(0.520)	(0.419)	(0.439)	(0.418)
T Deviation 1C to 2C	-0.478	-0.062	0.575	1.682***
	(0.601)	(0.452)	(0.512)	(0.471)
T Deviation >2C	-2.379***	1.556**	0.789	2.925***
	(0.785)	(0.666)	(0.745)	(0.531)
Mean Outcome (-1 to 0)	12.66	13.15	12.85	13.39
Average T (-1 to 0)	20.39	26.48	28.42	31.20
Fixed Effects:				
Constituency	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Month	Yes	Yes	Yes	Yes
Day of Year	Yes	Yes	Yes	Yes
Observations	7671	9089	8519	9047

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the margin of victory of the winner in percentage. We present subgroup estimates by assigning each constituency to a quartile based on their weighted average temperatures, where Q1 corresponds to the coolest regions and Q4 to the hottest regions. A weighted average temperature is calculated for each constituency by averaging the contemporaneous heat exposure on election day, weighted by the number of electors in that given year. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 8: Impact of Heat on Aggregate Turnout by Reservation Status of Constituency

	(1) Not Reserved	(2) Reserved
T Deviation <-2C	0.417***	-0.558
	(0.156)	(0.362)
T Deviation -2C to -1C	-0.176	0.292
	(0.142)	(0.278)
T Deviation 0C to 1C	0.388***	-0.020
	(0.117)	(0.261)
T Deviation 1C to 2C	0.738***	0.204
	(0.144)	(0.345)
T Deviation >2C	1.004***	0.230
	(0.188)	(0.374)
Mean Outcome (-1 to 0)	68.52	69.21
Fixed Effects:		
Constituency	Yes	Yes
Year	Yes	Yes
Month	Yes	Yes
Day of Year	Yes	Yes
Observations	27219	9552

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the total voter turnout in percentage. We present subgroup estimates by the reservation status of the assembly constituency, where constituencies classified as 'General' are coded as 'Not Reserved', and all others are coded as 'Reserved'. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 9: Impact of Heat on Male Turnout by Reservation Status of Constituency

	(1) Not Reserved	(2) Reserved
T Deviation <-2C	0.221	-0.501
	(0.163)	(0.360)
T Deviation -2C to -1C	-0.327**	0.246
	(0.145)	(0.276)
T Deviation 0C to 1C	0.430***	0.082
	(0.119)	(0.257)
T Deviation 1C to 2C	0.607***	0.080
	(0.150)	(0.328)
T Deviation >2C	0.772***	0.369
	(0.195)	(0.367)
Mean Outcome (-1 to 0)	70.28	71.28
Fixed Effects:		
Constituency	Yes	Yes
Year	Yes	Yes
Month	Yes	Yes
Day of Year	Yes	Yes
Observations	27219	9552

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the total male voter turnout in percentage. We present subgroup estimates by the reservation status of the assembly constituency, where constituencies classified as 'General' are coded as 'Not Reserved', and all others are coded as 'Reserved'. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 10: Impact of Heat on Female Turnout by Reservation Status of Constituency

	(1) Not Reserved	(2) Reserved
T Deviation <-2C	0.577***	-0.646
	(0.188)	(0.420)
T Deviation -2C to -1C	-0.029	0.325
	(0.173)	(0.316)
T Deviation 0C to 1C	0.259*	-0.115
	(0.141)	(0.283)
T Deviation 1C to 2C	0.769***	0.350
	(0.170)	(0.387)
T Deviation >2C	1.123***	0.036
	(0.220)	(0.421)
Mean Outcome (-1 to 0)	66.25	66.39
Fixed Effects:		
Constituency	Yes	Yes
Year	Yes	Yes
Month	Yes	Yes
Day of Year	Yes	Yes
Observations	27219	9552

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the total female voter turnout in percentage. We present subgroup estimates by the reservation status of the assembly constituency, where constituencies classified as 'General' are coded as 'Not Reserved', and all others are coded as 'Reserved'. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 11: Impact of Heat on Gender Gap in Turnout by Reservation Status of Constituency

	(1) Not Reserved	(2) Reserved
T Deviation <-2C	-0.356**	0.145
	(0.160)	(0.297)
T Deviation -2C to -1C	-0.298**	-0.079
	(0.141)	(0.214)
T Deviation 0C to 1C	0.171	0.197
	(0.117)	(0.158)
T Deviation 1C to 2C	-0.162	-0.271
	(0.139)	(0.222)
T Deviation >2C	-0.351**	0.334
	(0.175)	(0.266)
Mean Outcome (-1 to 0)	4.04	4.90
Fixed Effects:		
Constituency	Yes	Yes
Year	Yes	Yes
Month	Yes	Yes
Day of Year	Yes	Yes
Observations	27219	9552

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the gender gap in voter turnout in percentage. We present subgroup estimates by the reservation status of the assembly constituency, where constituencies classified as 'General' are coded as 'Not Reserved', and all others are coded as 'Reserved'. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 12: Impact of Heat on Victory Margin (%) by Reservation Status of Constituency

	(1) Not Reserved	(2) Reserved
T Deviation <-2C	0.267	0.750
	(0.321)	(0.639)
T Deviation -2C to -1C	0.130	0.127
	(0.301)	(0.505)
T Deviation 0C to 1C	0.856***	0.496
	(0.249)	(0.465)
T Deviation 1C to 2C	0.556*	0.366
	(0.288)	(0.506)
T Deviation >2C	1.153***	0.516
	(0.383)	(0.641)
Mean Outcome (-1 to 0)	12.81	13.53
Fixed Effects:		
Constituency	Yes	Yes
Year	Yes	Yes
Month	Yes	Yes
Day of Year	Yes	Yes
Observations	26304	8977

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the margin of victory of the winner in percentage. We present subgroup estimates by the reservation status of the assembly constituency, where constituencies classified as 'General' are coded as 'Not Reserved', and all others are coded as 'Reserved'. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 13: Impact of Heat on Aggregate Turnout by Competitiveness of Election

	(1) Not Competitive	(2) Competitive
T Deviation <-2C	-0.201	0.558***
	(0.213)	(0.211)
T Deviation -2C to -1C	-0.281	0.151
	(0.181)	(0.181)
T Deviation 0C to 1C	0.298*	0.200
	(0.156)	(0.156)
T Deviation 1C to 2C	0.725***	0.430**
	(0.209)	(0.187)
T Deviation >2C	0.677***	0.796***
	(0.250)	(0.233)
Mean Outcome (-1 to 0)	71.23	65.57
Fixed Effects:		
Constituency	Yes	Yes
Year	Yes	Yes
Month	Yes	Yes
Day of Year	Yes	Yes
Observations	18078	17763

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the total voter turnout in percentage. We present subgroup estimates by the competitiveness of the assembly constituency in a given election, defining an election as competitive if the effective number of parties is at least three. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 14: Impact of Heat on Male Turnout by Competitiveness of Election

	(1) Not Competitive	(2) Competitive
T Deviation <-2C	-0.350*	0.411*
	(0.208)	(0.227)
T Deviation -2C to -1C	-0.323*	-0.074
	(0.175)	(0.193)
T Deviation 0C to 1C	0.271*	0.345**
	(0.153)	(0.162)
T Deviation 1C to 2C	0.574***	0.327*
	(0.208)	(0.190)
T Deviation >2C	0.493**	0.737***
	(0.244)	(0.250)
Mean Outcome (-1 to 0)	72.78	67.90
Fixed Effects:		
Constituency	Yes	Yes
Year	Yes	Yes
Month	Yes	Yes
Day of Year	Yes	Yes
Observations	18078	17763

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the total male voter turnout in percentage. We present subgroup estimates by the competitiveness of the assembly constituency in a given election, defining an election as competitive if the effective number of parties is at least three. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 15: Impact of Heat on Female Turnout by Competitiveness of Election

	(1) Not Competitive	(2) Competitive
T Deviation <-2C	-0.128	0.705***
	(0.243)	(0.259)
T Deviation -2C to -1C	-0.260	0.390*
	(0.213)	(0.219)
T Deviation 0C to 1C	0.256	0.007
	(0.175)	(0.190)
T Deviation 1C to 2C	0.780***	0.502**
	(0.232)	(0.227)
T Deviation >2C	0.758***	0.764***
	(0.280)	(0.279)
Mean Outcome (-1 to 0)	69.14	62.66
Fixed Effects:		
Constituency	Yes	Yes
Year	Yes	Yes
Month	Yes	Yes
Day of Year	Yes	Yes
Observations	18078	17763

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the total female voter turnout in percentage. We present subgroup estimates by the competitiveness of the assembly constituency in a given election, defining an election as competitive if the effective number of parties is at least three. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 16: Impact of Heat on Gender Gap in Turnout by Competitiveness of Election

	(1) Not Competitive	(2) Competitive
T Deviation <-2C	-0.222	-0.294
	(0.154)	(0.238)
T Deviation -2C to -1C	-0.062	-0.464**
	(0.142)	(0.192)
T Deviation 0C to 1C	0.015	0.338**
	(0.115)	(0.161)
T Deviation 1C to 2C	-0.206	-0.175
	(0.148)	(0.190)
T Deviation >2C	-0.265	-0.027
	(0.168)	(0.252)
Mean Outcome (-1 to 0)	3.64	5.24
Fixed Effects:		
Constituency	Yes	Yes
Year	Yes	Yes
Month	Yes	Yes
Day of Year	Yes	Yes
Observations	18078	17763

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the gender gap in voter turnout in percentage. We present subgroup estimates by the competitiveness of the assembly constituency in a given election, defining an election as competitive if the effective number of parties is at least three. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.

Table 17: Impact of Heat on Victory Margin (%) by Competitiveness of Election

	(1) Not Competitive	(2) Competitive
T Deviation <-2C	0.457	0.263
	(0.440)	(0.382)
T Deviation -2C to -1C	-0.407	0.596*
	(0.394)	(0.339)
T Deviation 0C to 1C	1.494***	-0.066
	(0.321)	(0.307)
T Deviation 1C to 2C	0.928**	-0.019
	(0.364)	(0.351)
T Deviation >2C	1.627***	0.243
	(0.464)	(0.473)
Mean Outcome (-1 to 0)	14.27	11.54
Fixed Effects:		
Constituency	Yes	Yes
Year	Yes	Yes
Month	Yes	Yes
Day of Year	Yes	Yes
Observations	17592	16761

Notes. Estimates are from linear regressions with fixed effects. The dependent variable is the margin of victory of the winner in percentage. We present subgroup estimates by the competitiveness of the assembly constituency in a given election, defining an election as competitive if the effective number of parties is at least three. All regressors are binary indicators for whether the deviation between contemporaneous temperature and the constituency's historical average falls within a given temperature bin. To present level effects, outcome and treatment variables are demeaned using a common set of fixed effects across all subgroup regressions. Standard errors are clustered at the assembly constituency level. *p<0.1 **p<0.05 ***p<0.01.