Long Ballots Reduce Voter Turnout

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Abstract

The costs of voting are not only administrative and logistical – they are also embedded in the choices that voters are asked to make. I argue that when elections ask voters to evaluate more choices, some individuals will abstain from the voting process entirely. Using individual-level turnout and ballot length data from eight California counties across three election cycles in a difference-in-differences design, I find that five to six additional contests reduce voter turnout by 1 percentage points, on average. These effects are stronger among younger individuals and those living in lower-education census tracts. Contests with high levels of roll-off among voters are most likely to dissuade citizens from returning a ballot. These results show that task of evaluating candidates and contests is itself a barrier to electoral participation.

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A central question in the study of American politics concerns why voter turnout remains modest and why participation varies so much across individuals. Political scientists and policymakers have long been interested in identifying interventions that shift the rates of electoral participation. A considerable amount of recent research has focused on ballot access, examining reforms that broaden or restrict an individual's ability to register, obtain, and return a ballot. However, voting also requires that individuals evaluate the choices presented to them, and this task can itself be burdensome.

Around a quarter to a third of eligible voters fail to cast a ballot even in states like Oregon, Washington, and Illinois with the lowest "Cost of Voting" scores (Schraufnagel et al., 2022) or highest "State Democracy Index" scores (Grumbach, 2023). Non-voters primarily cite disinterest in politics and indecision over candidates, not physical hurdles to accessing a ballot, as their primary reasons for abstention (Newall & Machi, 2020; Verba et al., 1995). Americans do not view the process of selecting candidates as trivial: choosing a preferred candidate in a school board contest is rated as more difficult than registering to vote or voting in person (Grimmer et al., 2026). A complete accounting of the barriers to voting must therefore incorporate the decision-making demands of filling out a ballot, not just the logistical demands of obtaining one.

This paper demonstrates that the decisional demands of completing a ballot influence voter turnout. Ballot length is a component of the informational and decision-making demands that voters face. Longer ballots mean that voters must make more decisions, often in low-information contests. I leverage idiosyncratic variation in ballot length within eight California counties. Because state and local California races are mostly on-cycle and often have staggered 4-year terms, voters' locations within overlapping layers of city, county, school, and special district boundaries generate substantial variation in ballot length as offices rotate on and off the ballot. I use a difference-in-differences design that compares changes in an individual's ballot length against changes from others within the same city or county. I find that when ballot length increases, voter turnout decreases. On average, an additional 5-6 contests on the ballot reduces voter turnout by about 1 percentage point.

Unlike voter ID laws or registration requirements, which can only burden individuals

who lack identification or miss deadlines, the informational and decision-making burden of ballot completion are embedded in the structure of the election itself. All voters are assigned a ballot of some length, and in order to vote, they must allocate some of their free time toward navigating their local political landscape. I find that the ballot-length penalty is visible across most of the electorate, but it is largest among groups with lower propensities to participate in elections.

Finally, I find that not all contests affect turnout equally. Higher-profile local contests like city council offices are associated with increased turnout, while lower-information contests such as those pertaining to special districts (like water or health boards) and education drive the negative effects. These findings are consistent with an account where heightened decision-making demands of ballot completion are themselves a barrier to participation.

Ballot complexity and the burdens of voting

Recent work on the cost of voting in the United States has focused prominently on an individual's ability to access a ballot, focusing both on the impact of reforms that lower the administrative and logistic costs of voting. Reducing travel time and expanding the voting period (Brady & McNulty, 2011; Dyck & Gimpel, 2005; Gronke et al., 2007; Kaplan & Yuan, 2020; Thompson et al., 2020; Walker et al., 2019; Yoder et al., 2021), easing registration and identification (Bonica et al., 2021; Grimmer et al., 2018; Hajnal et al., 2017) and outreach (Dale & Strauss, 2009; Gerber & Hopkins, 2011; Hopkins et al., 2023) are all interventions theorized to lower the costs of voting for at least some sub-populations, though their effects on turnout are mixed. Indices on the costs of voting predominantly focus on these administrative and logistic costs (Grumbach, 2023; Schraufnagel et al., 2022).

Completing a ballot is also burdensome. [1] In order to fill out a ballot, a voter must understand their own preferences, gain information about candidate attributes and prefer-

[1] Throughout this paper I refer to informational and decision-making costs or burdens as the effort voters must expend to evaluate candidates and contests, not literally as the parameter C from Downs (1957) and Riker and Ordeshook (1968). A longer ballot plausibly increases the effort required to participate while also altering the perceived benefits through additional opportunities to express preferences, for an aggregate indeterminate input into the overall cost of voting. The effects estimated in this paper reflect the net of these forces rather than the isolated effect of ballot length on C or B.

ences, and translate these assessments into choices. Doing so is a burden on citizens' free time (Elliott, 2023), as the vast majority of Americans only follow politics casually or not at all.[2] Americans do not view the process of picking candidates as completely trivial – in fact, making a decision on a candidate in a school board contest is considered to be more difficult than the act of showing ID to vote, voting in person, and registering to vote (Grimmer et al., 2026).

The difficulty of political decision-making can vary as the difficulty of gaining information varies and as the quantity of decisions that must be made varies. Several studies have considered the former: Information interventions, both on and off the ballot, typically aid prospective voters in translating their preferences to choice, and studies have mostly considered the effect of these interventions on candidate choice (Boudreau et al., 2019; Dowling et al., 2025; Dunning et al., 2019; Fowler & Margolis, 2014; Klein & Baum, 2001), though there is some work on the decision to vote (Dunning et al., 2019; Miller et al., 2017; Reilly & Richey, 2011). This paper studies the latter.

Ballot complexity and electoral participation

Ballot complexity involves the quantity and difficulty of decisions that prospective voters must make. Voters must make high quantities of decisions when there are numerous candidates on the ballot or when there are numerous contests on the ballot. Variation exists across both margins in American elections. Primary elections regularly feature many candidates per contest, and voters are tasked with both matching their preferences to candidate positions and considering general election viability. This paper focuses on general elections, where the quantity of candidates on the ballot is typically fixed at either two candidates per contest or one candidate per party per contest,[3] but where ballot length varies considerably due to the presence or absence of state and local contests.

When voters are tasked with making more decisions, voters become more likely to make errors and use heuristics (Augenblick & Nicholson, 2016; Bernardo et al., 2022; Cunow et

[2] https://www.nytimes.com/2020/10/20/opinion/polarization-politics-americans.html

[3] This study uses data from California, where the jungle primary is used and general election contests typically have two options.

al., 2021; Selb, 2008) as well as to abstain in down-ballot contests (Augenblick & Nicholson, 2016; Stutzer et al., 2019). These findings are all consistent with the idea that there is some gradient of effort that individuals are willing to allocate towards political decision-making. When ballots ask too much of individuals, they are less willing to make well-informed choices.

The effects of ballot complexity have thus far been studied mainly at the intensive margin – at contest level, among those who have already decided to participate. Existing work shows that longer or more difficult ballots increase abstention within particular contests, but these designs condition away a distinct and substantively important response: some individuals may opt out of the election entirely.[4] This paper therefore shifts attention from how voters allocate participation across contests to whether ballot complexity influences who enters the electorate in the first place. This distinction matters because if complexity deters participation at the extensive margin then individuals are forgo voting in contests they would otherwise be motivated to vote in. If this abstention from the electoral process is disproportionately concentrated on certain populations, then ballot length itself may also be a source of inequality in turnout.

Whether we expect ballot length to influence overall turnout, and not just abstention, depends on how we expect voters to approach the informational and decision-making costs of voting in more contests. Many individuals will opt to incur decision-making costs and vote under all current levels of decision-making costs. As shown in the above studies, when some individuals deplete the amount of attention they want to spend contemplating elections, they decide to use heuristics or random selection or choose to abstain. However, others may observe that the anticipated cost of making the full set of electoral decisions is more than they are willing to incur, and forego the process altogether. As a counterbalance, others may find the opportunity to exercise voice in additional contests sufficient reason to participate despite the added demands. Taken together, however, there is reason to expect that ballot length may shape both whether and how an individual votes in a certain contest, but also whether they opt to vote in any contest at all.

[4]The closest paper is Cunow et al. (2021), who combine ballot roll-off, on-ballot abstention, and non-turnout into a single measure and find that contest-level (mayoral) participation in Brazil decreases when ballot complexity increases. However, they do not explicitly consider the extensive margin.

While the pathway for overall abstention from voting due to ballot length has not been studied in political science, research on survey methodology and non-voting administrative burdens offer further evidence that prospective voters might fully fail to turn out when they encounter a longer ballot. Galesic and Bosnjak (2009) find that when a survey is described as having a higher anticipated length, fewer respondents started and completed the survey, and Edwards et al. (2002) and Heberlein and Baumgartner (1978) find that longer surveys are less likely to be returned. In the study of citizen-administrative interactions, the simplification of forms increases program enrollment (Beshears et al., 2013; Bettinger et al., 2012; Mueller & Yannelis, 2022). Since voting is a complex form, these findings provide reason to expect that turnout decreases when ballots require individuals to work through more contests.

Do the effects of ballot complexity vary?

If ballot complexity is responsible for demobilizing potential voters, then effects may be heterogeneous across individual characteristics and contest type. Works on the provision of information demonstrate that willingness to engage in costly decision-making processes is heterogeneous across individuals: Mummolo and Peterson (2017) find that voter guides were most used by those with high levels of political interest and Miller et al. (2017) find that turnout increased the most among registrants in above-median household income census tracts. Those most willing to exert effort into electoral decision-making are the same kinds of people who were already prone to learn about candidates and vote. Based on these results, those most likely to be demobilized by higher political burdens are likely those with less political interest and lower baseline propensities to participate. Since I use administrative data, I cannot measure political interest. However, in order to test whether those most impacted by ballot length are individuals who are typically less involved in politics, I consider an individual's age, census block group income level, and partisan registration in Tables 3-4.

Longer ballots may not decrease turnout for all voters in all situations. Longer ballots mechanically increase the number of decisions that an individual must make to complete a ballot (increasing the time that individuals must allocate toward voting), but simultaneously also provide additional domains for voters to influence policy (possibly increasing benefits).

Additional ballot items do not necessarily impose a uniform marginal burden or benefit on all citizens. For some voters, particularly those who are more politically anchored or deeply embedded in their local communities, the average additional contest may produce benefits equal to or greater than the added cost from decision-making. How longer ballots directly the underlying components of the voting calculus is indeterminate since it depends on the specific voter and the weight of these competing forces, necessitating a data-driven study on the effect.

The net effect of additional contests likely also varies by contest type. In national and statewide races, information on contests is cheap and interest in these contests is comparatively high, meaning that an additional national or statewide contest may even increase turnout (Juelich et al., 2024). Cues and media coverage on down-ballot contests, especially those outside the city or county level, are not reliably available, so these contests are inherently more difficult to learn about. These contests also have some of the highest rates of ballot roll-off (Figure 4), indicating that interest in these contests is comparatively low. As a result, if ballot length affects turnout through the difficulty of decision-making, its demobilizing effects should be concentrated on contests that add electoral decisions without correspondingly increasing the benefits of participation. I suggest that this is indeed the case in Table 5.

Data and Setting

I use data from eight California counties: Alameda, Contra Costa, Fresno, Orange, San Diego, San Francisco, San Mateo, Santa Clara. These counties were selected due to a combination of easier-to-use election data, high populations, and for having within-city and within-county variation in ballot length. I use data from the 2016, 2018, and 2020 November general elections. In California, the general election ballot includes local, state, and federal contests. I focus on even-year general elections only in order to retain similar headlining contests across all observation-years.

My analyses combine data from multiple sources, detailed in Table 1. I measure voter turnout, the dependent variable, at the individual level by turning to voter files from the

California Secretary of State (January 2017) and L2 (January 2019 and November 2020), an independent voter file vendor. I subset the data to individuals who have continuously lived within the eight counties within the period of study (including those who move between counties). These voter files indicate voter address, turnout, age, and registered partisanship, and are linked together using California voter identification numbers. The L2 files include household coordinates, and I generate household coordinates for the January 2017 file using ArcGIS StreetMap. Household addresses are based on an individual's registration address, not their mailing address (which are regularly PO Boxes or international addresses).

For each individual-year, I determined a voter's precinct by using household's coordinates and election-specific California-wide precinct shapefiles from the California Statewide Database.[5] This geographic merging process may be subject to some error, and in Appendix Table 9, I remove precincts that appear to have some mis-measured residents, and find slightly larger coefficients than those in Table 2, indicating that geo-coding errors are not driving results.

Source	**Description**
L2	2019, 2020 voter files (turnout, age, partisanship, Census block, coordinates)
CA SoS	2017 voter file (turnout, age, partisanship, address)
ArcGIS StreetMap	Geocode 2017 voter file addresses → coordinates and Census block
Statewide Database	Precinct-by-year GIS maps (compatible with coordinates)
Counties	By-precinct election results
ACS	By-block group education

Table 1 – Data sources

To assess heterogeneous effects by education, I use data from the American Community Survey on the percent of block group residents with a bachelor's degree or higher. To assess heterogeneous effects by party and age I use values reported by the voter files. Census block groups are taken directly from L2 (2019-2020 files) and through ArcGIS Streetmap

[5]This process leaves the precinct missing for some individuals (about 0.2% in 2016 and 0.15% in 2018-2020). A secondary procedure, which matches coordinates to census blocks, and then uses California-wide election specific census block-to-precinct matching, is utilized for these cases. In the 4.8% cases where blocks are split between more than one precinct, I assign all block residents to the precinct where the most block residents belong.

for the 2017 file. To aid in interpretation, age and education are both split into county-level quintiles.

The panel is comprised only of individuals who have stayed within these eight counties: those who moved in or out of these counties during the period of study are excluded. In total, this data amounts to 4,750,202 registered voters each year, over three years, for 14.25 million individual-election observations. About 7.3% of these registered voters reside within unincorporated county areas, and the rest live in incorporated municipalities. These registered voters are arranged within 20,993 precinct-years.

To recover ballot length, the independent variable, I collect and process precinct-level Statement of Votes for the eight California counties. These are sourced from county election result archives.[6] I calculate the number of contests on the ballot and the types of contests on the ballot on the precinct level. The categorization of contests is detailed in Appendix 1.1, and results using these categorizations are shown in Table 5. According to California law, city council, congressional, state legislative, supervisor, and similar districts must be consistent within a given precinct,[7] though precincts may have split special district or school board boundaries.[8] The next subsection covers ballot length extensively.

An important step for ballot length to reduce voter turnout is that prospective voters (including non-voters) must observe ballot length and use that information in deciding to vote. A distinct advantage of the California case is that the state and counties invest heavily in distributing information to registered voters. Before voting, registered voters are informed about what is on the ballot ahead of election day. Even prior to the adoption of universal mail voting, the state and counties mailed guides making prospective voters aware of each of the contests on the ballot. These guides also included a sample ballot, an "exact copy of the official ballot,"[9] making it very clear what to expect on the actual ballot. Subsequently, prospective voters may clearly observe ballot length prior to election day, and incorporate

[6] The Statewide Database, affiliated with Berkeley Law School, has local results available only for races 2022 and onward, so county-sourced files are necessary.

[7] https://ocvote.gov/apps/legtracker/elections-code/print/?sections=12220-12225

[8] Appendix Table 9 considers this potential issue, and finds that this paper's core results are not a byproduct of mis-counting special district and local education contests.

[9] https://vote.santaclaracounty.gov/vote-mail/county-voter-information-guide

information about ballot length into their decision to turn out.[10] In recent years, citizens have been able to directly interact with the actual ballot ahead of election day. In response to the coronavirus pandemic, California adopted universal mail voting, allowing for voters to consider ballot length while filling out the ballot. Even prior to that, over half of all Californian ballots cast were by mail.[11] Differences between universal vote-by-mail years and earlier years are further discussed alongside Table 13.

Understanding variation in ballot length

In this section, I first describe what determines ballot length, then discuss within-county and within-city variation in ballot length. Finally, I discuss within-county and within-city variation in year-to-year *shifts* in ballot length, which is what I leverage for causal identification.

Ballot length

The independent variable is the number of contests on an individual's general election ballot, as measured at the precinct-level using by-precinct election returns from counties (detailed in the previous section). This is an important component in the difficulty of voting.[12] Within my dataset, the number of contests on a general election ballot varies between 14 and 61, though substantial by-year differences are driven by national-level and statewide races (particularly the quantity of statewide ballot measures). Figure 1 describes within-city-year and within-county-year variation. In 2016, voters from these eight counties voted on 22-47 contests, with 30-61 (14-35) in 2018 (2020).

Ballot length is determined by the interaction between time and an individual's place of

[10] Though not all states provide voter guides and sample ballots, Americans across the country may reliably input their address into online tools such as Ballotpedia and Vote411 from the League of Women Voters and accurately observe what contests and candidates will be on the ballot.

[11] https://www.sos.ca.gov/elections/historical-absentee

[12] While I operationalize ballot complexity as the number of contests that voters are meant to vote on, it is not a perfect proxy for overall ballot complexity and is not a direct measure of C. As conceptualized above, ballot complexity involves a consideration of the difficulty of choices that individuals must make, in addition to the quantity of choices. California Supreme Court Justice elections use approval voting, whereas school boards often have voters vote for multiple candidates within a single contest (these are considered a single contest), and Oakland local offices employ ranked-choice voting. Furthermore, the information environments surrounding each contest additionally vary.

residence: it is a product of election timing cycles and layers of administrative boundaries for contests. The maximum possible number of contests that an individual may vote on is determined by administrative boundaries, such as state senate, city, county, community college, school, and additional administrative districts (such as fire, healthcare, and water districts), in addition to federal and statewide contests, including statewide direct democracy.[13] For some of these, particularly city and school board, residence within them is often an intentional choice: cities tax more than unincorporated areas but provide more services to their residents, and school district quality is often an important consideration for parents. In California, these additional layers of governance translate to additional contests on the ballot. Within a county, residents of bigger cities routinely have longer ballots than residents of unincorporated areas, as visualized in Figure 2, making cross-sectional, single-year correlations uninformative.

Within-city and within-county variation

In a given year, why does ballot length vary within a single city or county? The biggest component is the timing of elections across the overlapping districts that a given address belongs to. Many seats have staggered 4-year terms, so only a subset of all seats are up in a particular year. As these fixed cycles rotate, a given address is assigned to a different bundle of contests.

A mid-term vacancy, redistricting, or district creation can create one-off additional elections. Direct democracy measures, whose timing and quantity are not fixed, additionally lengthen the ballot. Since these measures may arise from city, educational, or special districts, boundaries on these measures can be split within a county and city. Direct democracy measures are often not strategic since tax increases require voter approval.[14] However, most variation in ballot length originates from idiosyncrasies in contest timing and not from one-off contests, and Appendix Table 12 shows that results are robust to the exclusion of these

[13] Some cross-time variation is a consequence of statewide and federal races experienced by all Californians. Not all races occur each year, and the number of statewide direct democracy measures that make the ballot varies each year. As discussed below, these are accounted for by the use of (city- or county-) year fixed effects.

[14] https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?article=XIII+C&lawCode=CONS&sectionNum=SEC.+2.

one-off contests.

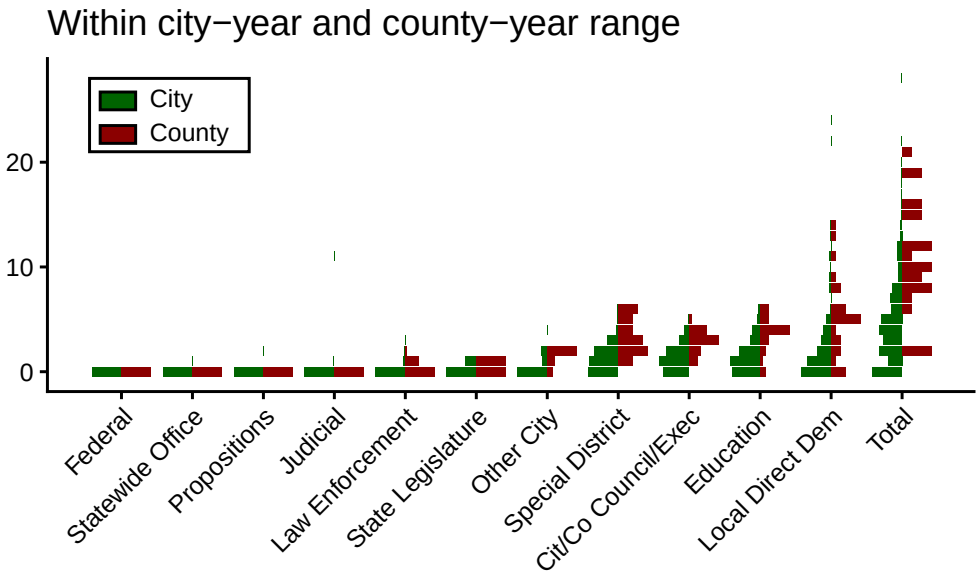

Figure 1 – Within-city-year and within-county-year ranges in the number of contests on the ballot, weighted by city-year (left) or county-year (right). Both within-city-year and within-county-year, variation in the independent variable comes from local and state legislative elections. The median range (maximum minus minimum) within a city-year is 4 contests (weighted by city-year), and the median range within a county-year is 10 contests (weighted by county-year).

Figure 1 plots the distribution of the range in the quantity of contests within a city-year or county-year. Bars show the city-wide (green) or county-wide (red) range in the quantity of contests, for each type of contest. What kind of races vary within a given city or county? The first four office types of federal, statewide offices, statewide propositions, and judicial offer virtually no within-city-year or within-county-year variation, confirming that data on office type and counts per office type are correct.

State senate lines almost always conform to city boundaries when possible, so there is little within-city variation, but some within county variation. State assembly elections occur every two years, so they provide no additional variation. Education, city/county councils and executives, and special district contests provide substantial within-city-year and within-county-year variation. Local direct democracy measures (typically at the city, education, or special districts level) and other additional citywide offices also provide substantial within-county-year variation.

Over-time shifts

Identification comes from over-time changes in ballot length. To illustrate both within-city/within-county variation and over-time variation, Figures 2 and 3 map out the distribution of ballot length within 2018-2020 Santa Clara County and Sunnyvale (a city within Santa Clara County). The first panels show variation in ballot length in 2018, the middle panels show variation in ballot length in 2020, and the rightmost panels calculate the difference. Identification depends only on the third panel.

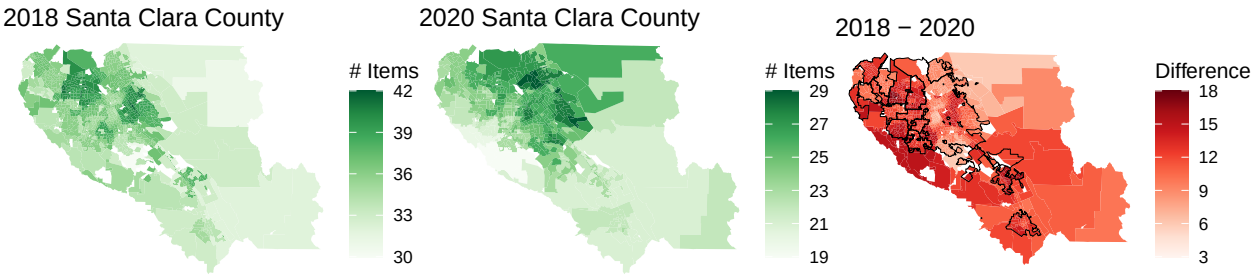

Figure 2 – 2018 and 2020 distribution of ballot length within Santa Clara County. Black lines in the third panel denote city boundaries. Areas without black borders denote unincorporated Santa Clara County.

In Figure 2, the outlying unincorporated areas typically have shorter ballots in both 2018 and 2020 (city boundaries are denoted in black in the final panel). This demonstrates that it is inappropriate to simply take the cross-sectional, single-year correlation between ballot length and voter turnout. Doing so would simply recover rural-urban differences in turnout.

However, the difference in 2018 to 2020 ballot length is not explained by city-unincorporated boundaries: the variation from the 2018-2020 shift in ballot length is well-distributed across the county. The areas with the biggest changes in ballot length include both precincts within cities as well as unincorporated Santa Clara County. Likewise, the areas with the smallest shifts in ballot length include both precincts in cities as well as in unincorporated Santa Clara County. In short, the 2018-2020 changes arise due to institutional rotation, differencing out the broader urban-rural explanations for ballot length.

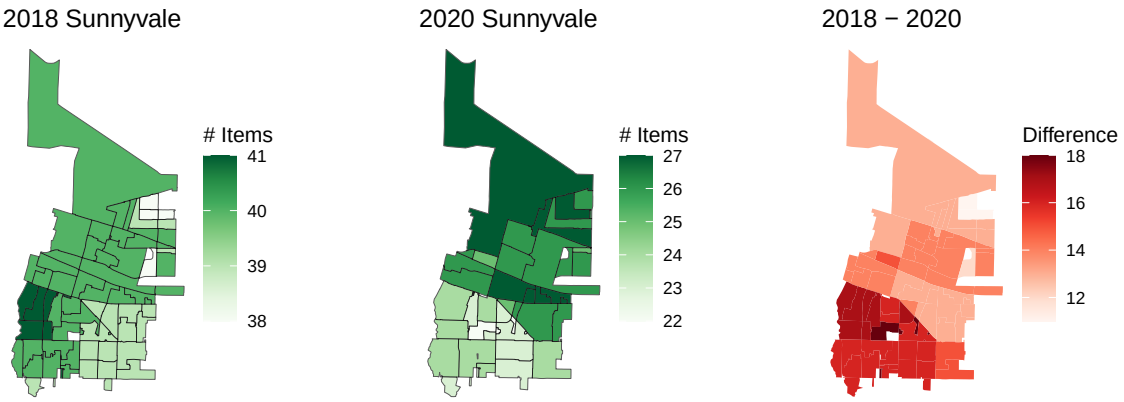

Figure 3 – 2018 and 2020 distribution of ballot length within Sunnyvale, in Santa Clara County. Black lines in the first and second panels denote precinct-year boundaries.

Figure 3 shows variation in ballot length between 2018 and 2020 within a single city. As in Santa Clara County, a longer ballot in 2018 is not well-correlated with a longer ballot in the following election. Though the range of 2018-2020 differences are more compressed, over time variation in changes in ballot length is indeed present within-city.

Design

I take a difference-in-differences approach using a two-way fixed effect model with individual and county-year or city-year fixed effects, outlined in Equation 1. The dependent variable is an individual's turnout in a given year (0 or 1). The quantity of interest, β, represents the change in voter turnout probability as an individual's ballot becomes one contest longer, in percentage points, relative to others residing in the same place at the same time. Since treatment length is assigned at the precinct-year level and I have multiple observations per individual, I cluster standard errors by precinct-year and individual.

$$Turnout_{it} = \beta * length_{it} + \omega_{tc} + \alpha_i + \epsilon \tag{1}$$

Individual fixed effects α_i account for stable over-time turnout propensities for each individual i. As described above, this design leverages variation in ballot length within cities or counties, represented by ω_{tc}. Area c in Equation 1 represents city or county and time t represents a given election year.

National, statewide, and county-wide (and optionally, city-wide) contests are assumed to be inherent to the year t's election and are fully absorbed by ω_{tc}. This enables me to isolate the effect of the change in an individual's ballot length relative to changes among individuals within the same area, in the same year. The use of time-area fixed effects (instead of just time fixed effects, as is standard in two-way fixed effects models) is important when using data across cities and counties, as time-county shocks may arise as a result of current events in an area. The results in this paper present both specifications using city-time and county-time fixed effects, and these specifications capture a tradeoff between tighter geographic comparisons versus increased variation and coverage. The use of county-year fixed effects allows for individuals living in unincorporated communities to be included within the analysis and is able to use citywide races as a source of identifying variation. City-time fixed effects allow for a tighter comparison since they can account for city-specific shocks and citywide electoral conditions.

Because identification comes from within-city-year or within-county-year shifts, the comparison is among voters experiencing the same statewide and national election context, differing only in the state and local contests layered onto their ballots, as shown in Figure 1. This design cannot capture the marginal effect of additional statewide contests such as statewide ballot initiatives. As a result, β should be interpreted as the effect of an additional mostly-local contest on turnout.[15]

Inference

I use a generalized version of the canonical two period difference-in-differences estimator, with continuous treatment over time. The identifying assumption for causal interpretation of results is that voter turnout would have evolved similarly across units, had ballot length not varied. Since there is no defined on/off treatment status, the parallel trends assumption is difficult to graph, but can be tested in multiple ways. The primary concern is that ballot length at time *t+1* predicts turnout at *t*, or in other words, the people who end up with longer

[15]While it may seem that this is equivalent to the effect of a low-salience race on turnout, it is important to note that not all statewide contests are of popular interest and not all local races are low-salience. In Figure 4 I show that rolloff is very high for judicial races and rolloff can sometimes be low in mayoral/executive and council races.

ballots are already on different turnout trajectories, even after accounting for city/county and time. Appendix Table 8 shows that each additional contest on a future ballot increases turnout by 0.02 percentage points – a small opposite-sign effect from my estimates of β.

An important concern is that of reverse causation: perhaps low engagement in t causes longer ballots in the *t+1*. For example, low engagement in t may cause the election of low-quality lawmakers, who fail to finish their term, leaving additional special elections on the ballot in *t+1* within a locale already prone to low participation. In Appendix Table 11, I fail to find that low engagement at t predicts long ballots at *t+1*: on average, a voter in time t has fewer than 0.1 *more* contests on their ballot in *t+1* relative to a non-voter. In aggregated terms, if voters in area A at time t had turnout 10 percentage points lower than average, they are expected to have less than 0.01 *fewer* contests on the ballot in *t+1* relative to the mean.

I do not require that Californians persistently reside at a single address throughout the period of study, as long as they are registered in any of the eight counties that I have data for after all three elections. The advantage of this strategy is that I am able to capture a larger section of the population while maintaining the panel structure. However, a drawback is that people do not move randomly, and my empirical strategy is particularly threatened if people tend to move from areas with shorter ballots to areas with longer ballots, since the act of moving itself is known to decrease voter turnout (Squire et al., 1987). In Appendix Table 6, I remove across-county movers and show that effects persist. Similarly, individuals may move but fail to update their voter registration. In Table 7, I use 2016-2018 turnout data, conditional on voting in 2020 (the last year in my panel), and again find that longer ballots decrease voter turnout.

Most variation in ballot length is due to electoral cycles. However, some contests arise due to political factors that may be related to turnout. Among these are citywide yes/no policy questions, which do not pose a threat to inference because they are accounted for within specifications using city fixed effects. However, school and special districts may also place bond measures on the ballot, and special elections due to political forces, such as a recall or mid-term resignation, also cause ballot length to increase. Generally, we might expect

that these additional contests should increase voter turnout, cutting against my results: for example, a recall may only occur if there is some level of public support to recall an officeholder, but it is possible that these processes go through with only the support of intense local interests and not the general public. Special races labeled as recall or short/partial/2-year term contests constitute fewer than 1% of precinct-contests and 93.5% of observations have no contests with these terms. In Appendix Table 12, I show specifications that remove non-regular races from the total and specifications that remove individuals with any non-zero quantity of special races on the ballot, and both confirm results from the main text.

Finally, the main results in Table 2 operate under the assumption that the marginal effect of an additional contest is the same across all contest types, all electoral settings, and all individuals. Follow-ups in Tables 3-5 reveal that effects do depend on the context. In these tables, I consider individual age, education (aggregated by block group), individual partisanship, seat type, and mail voting. The findings in these tables further support that the decline in turnout is higher in situations where the effort required to learn about and select candidates is higher.

The effect of an additional contest on turnout

I first consider the main model specified in Equation 1, investigating whether overall turnout decreases when ballots become longer. In all tables, I present results from two regressions: one using city-year fixed effects and the second using county-year fixed effects. All regressions in this paper additionally use individual fixed effects in order to ensure that the estimates are not driven by persistent differences between high- and low-propensity voters who happen to live in systematically different ballot environments.

Table 2 presents results. In Column 1, I find that relative to other registered voters within the same city and after accounting for an individual's propensities to vote, an individual with an additional contest on their ballot is 0.192 percentage points less likely to return a ballot. The use of city-year fixed effects ensures that individuals are only compared to individuals who have very similar ballots: outside of the very largest cities, cities tend to have very high

Table 2 – Individuals with more contests on the ballot are less likely to turn out to vote

	Prob Turnout (0-100%)	
	(1)	(2)
Contests on ballot	−0.192	−0.172
	(0.020)	(0.011)
Geo-Time FE	City-year	County-year
Individual FE	X	X
N	12719910	14231726

Standard errors clustered by precinct-year and individual.

ballot overlap with the exact same mayoral, federal, and often state legislative districts.

Column 2 repeats the exercise with county-year fixed effects (as well as individual fixed effects), buying more variation in ballot length, as within-county variation in ballot length is substantially larger than within-city variation in ballot length (Figure 1). This additional variation, however, means that I no longer condition on the presence of headlining city contests such as city-wide measures or mayor. I similarly find that a single additional contest causes a 0.172 percentage points decrease in turnout. If the contests providing within-city variation are equally demobilizing as the contests that provide within-county variation, then the coefficients in column 1 and 2 should be highly similar. The coefficient from column 2 is somewhat smaller in magnitude than that from column 1, suggesting that the addition of some contests fully absorbed by city-time fixed effects (such as mayor) could be less demobilizing or even mobilizing. I investigate this possibility further in Table 5.

Together, these results indicate that each additional local contest leads to about a 0.2 percentage points decrease in voter turnout, on average. While the effect for one additional contest is somewhat small, they can add up. Five or six additional local contests decrease voter turnout by about one percentage point. As an illustrative example, San Diego County's 2018 election, the difference between a voter in the 25th percentile and 75th percentile of ballot length is 9 contests – equivalent to about a 1.5 percentage point decrease in predicted turnout for registered voters living in longer ballot areas relative to lower ballot areas. These represent meaningful changes in voter turnout. The San Diego 25th to 75th percentile dif-

ference is similar in absolute magnitude to the effect of shutting down one's regular polling place (Brady & McNulty, 2011), the pooled meta-analysis-recovered effect door-to-door canvassing in elections with similar population turnout rates (Green & Gerber, 2019), and to the pooled meta-analysis-recovered effect of social pressure mail in high salience elections (Mann & Haenschen, 2024).

The complexity of selecting a preferred candidate and filling out a ballot is a real constraint in the overall decision to return a ballot. In contrast with interventions that target specific subpopulations (such as voter ID or registration deadlines, which may only impact people without ID or miss registering to vote), ballot length is a feature of the election itself. Elections impose decision-making demands on all voters, even if those demands are experienced differentially. On average, each additional contest modestly reduces the probability that a registered voter will return a ballot, but these effects accumulate across the range of ballot-length variation commonly observed in actual elections. Ordinary differences in ballot length can generate turnout shifts similar in magnitude to electoral interventions and disruptions that the literature typically treats as substantively important.

Heterogeneous effects

In this section, I consider the relationship between ballot length and voter turnout among varying demographic attributes. I anticipate that turnout decreases more among populations with a lower interest in politics and with lower levels of political sophistication. To do this, I use a regression similar to Equation 1, where instead of a pooled β, I calculate subgroup-specific βs.

An important detail on the interpretation of Tables 3-4 is that individual-level demographics are not randomly assigned. The βs do not describe the causal effect of being a certain age, living in an area with a certain education level, or of being a certain party on how strongly ballot length affects turnout. Instead, these interaction coefficients describe the causal effect of an additional contest on the ballot among those within a given demographic. For example, residing in a less-educated area is correlated with being younger, and both are

correlated with lower income levels. Without randomization, this design is not able to rule out age, education, income, or other factors as the root cause of the disparities found in Tables 3-4. Instead, the purpose of these regressions is to make it clear that the penalty for ballot complexity varies by subgroup.

Educational attainment is one plausible proxy for the additional effort necessary to navigate a longer ballot. Education is a powerful predictor of political knowledge and turnout, and individuals with lower levels of educational attainment may find it more difficult to conduct the necessary research to complete a long ballot, on average. The first two columns of Table 3 test whether the effect of additional contests on voter turnout varies by educational attainment. I do not have educational attainment by individual.[16] Rather, I use the proportion with at least a bachelor's degree, within an individual's block group in 2016 (block group is the most granular level for which the ACS measures educational attainment), split into quintile by county.

The first two columns of Table 3 show that the effect of longer ballots on turnout attenuates as the average education level of an individual's block group increases. In block groups with the highest levels of educational attainment, the penalty virtually disappears: on average, it takes about 23 (250) additional races on the ballot to decrease turnout in the highest educated block groups by 1 percentage point under the city-time (county-time) fixed effects specification. However, in block groups with the lowest levels of educational attainment, an additional four contests on the ballot decreases an individual's likelihood of turning out to vote by around 1 percentage point under both the city-time and county-time specifications.

A similar exercise is repeated using individual-level data. While income, race, and education are important stratifications not directly collected in the voter registration process, age is included within the voter file. While income, race, and education are spatially correlated, age is substantially less so, making it a useful additional source of heterogeneity. Age is a strong predictor for participation in politics, particularly at the local level. Older individ-

[16]Though the L2 voter file attempts to estimate individual education, the estimation procedure is opaque and somewhat based on census geographic estimates.

Table 3 – Younger individuals and individuals living in census block groups with the lowest levels of educational attainment experience higher decreases in turnout for each additional local contest.

	Probability Turnout (0-100%)			
	(1)	(2)	(3)	(4)
Contests×Quint=1	−0.225	−0.239	−0.380	−0.371
	(0.020)	(0.011)	(0.019)	(0.010)
Contests×Quint=2	−0.145	−0.145	−0.302	−0.283
	(0.020)	(0.011)	(0.019)	(0.010)
Contests×Quint=3	−0.085	−0.087	−0.159	−0.131
	(0.020)	(0.012)	(0.019)	(0.010)
Contests×Quint=4	−0.036	−0.017	−0.013	0.019
	(0.020)	(0.011)	(0.019)	(0.010)
Contests×Quint=5	−0.043	−0.004	0.121	0.157
	(0.020)	(0.012)	(0.019)	(0.010)
Quintile	Bl Grp Edu	Bl Grp Edu	Indiv Age	Indiv Age
Geo-Time FE	City-year	County-year	City-year	County-year
Individual FE	X	X	X	X
N	12717623	14229377	12719910	14231726

Standard errors clustered by precinct-year and individual. Quintiles are determined by 2016 levels within county. For education, the Quint=1 term corresponds to blocks groups with 0-21.4% with a BA or higher and the Quint=5 term corresponds to block groups with about 65% or higher with a BA (though these thresholds differ by county). For age, the Quint=5 term corresponds to about 60-65+ years old and Quint=1 is comprised of individuals in their late teens to early thirties.

uals are likely to have an interest in community affairs, through mechanisms like over-time community embeddedness and asset-holding within the community. Retirement may also give some older individuals more free time to research candidates and issues ahead of the election. In the third and fourth columns of Table 3, I consider an individual's age quintile among the sample of registered voters.

Again, I create quintiles by county, as counties can vary in age distributions. I find that the ballot length penalty is substantially stronger for the youngest age group, typically comprised of those who were 18-32 in 2016. Among the youngest quintile, an additional three contests on the ballot decreased turnout by over 1 percentage point. In contrast, the direction of the effect reverses sign for the oldest age group, and coefficients are statistically significant: for the oldest fifth of registered voters, who are typically at least 60 in 2016,

an additional six or seven contests on the ballot *increases* voter turnout by 1 percentage point. Taken together, the results on age and education from Table 3 indicate that the turnout penalty from ballot length is concentrated among groups plausibly less equipped or less inclined to bear the informational burdens imposed by a longer ballot, even after accounting for city or county of residence and individual-level voting propensities.

Turnout among the oldest quintile increases when they encounter a longer ballot, consistent with the expectation that politically anchored, community-embedded individuals may find additional contests mobilizing. Under some conditions, added contests may also increase the perceived benefits of participation, even though the average effect in the full sample remains negative.

In Table 4 I also examine effects by party identification. Party registration is an imperfect but useful proxy for an individual's attachment to electoral politics, since only party registrants may participate in presidential primaries (all other major California elections use jungle primaries). Individuals registered with the Democratic and Republican parties turn out at substantially higher rates than those registered as non-partisan or with a third party.[17] As such, those outside of the two parties may be less politically anchored, and therefore less willing to bear the additional informational and decision-making demands imposed by a longer ballot.

Table 4 finds that the turnout penalty for non-partisans and third party registrants is substantially larger than that of partisans. This is consistent with the view that those least interested and least prone to participate in politics are the same types of individuals who are dissuaded from voting due to ballot length. The gap between Democrats and Republicans is distinct: Republicans are less dissuaded by longer ballots than Democrats. Because partisan registration in California is closely intertwined with other demographic and geographic attributes, the Democratic-Republican gap is more difficult to interpret. The clearest results, however, are that all partisan groups experience a non-zero turnout penalty from ballot length, and that effects are particularly strong among non-major party

[17] https://elections.cdn.sos.ca.gov/vca/2020-vca-report/appendix-e2-usc-reg-turnout-general.pdf

Table 4 – The penalty on ballot length is strongest for non-partisans

	Prob Turnout (0-100%)	
	(1)	(2)
Contests×Democrat	−0.160	−0.143
	(0.020)	(0.011)
Contests×Republican	−0.123	−0.091
	(0.020)	(0.011)
Contests×Non-partisan/Third Party	−0.279	−0.263
	(0.020)	(0.011)
Data	All	All
Geo-Time FE	City-year	County-year
Individual FE	X	X
N	12719910	14231726

Standard errors clustered by precinct-year and individual. Non-partisan includes third party registrants.

registrants.

The heterogeneous ballot length penalties are large relative to observed turnout gaps across groups. At the median ballot length (31), holding constant individual and city-year fixed effects, and using the city-year specification, the estimated turnout penalty differs by 5.6 percentage points between the most and least educated block group quintiles. This value is equivalent to 31.4% of the observed turnout gap among the most and least educated quintiles. The results are starker when looking at age. At the median ballot length, the corresponding difference in ballot length penalty between the oldest and youngest quintiles is equal to 65.9% of the observed turnout gap between the groups. The comparable figure is 34.6% (40.9%) for the turnout gap between Democratic (Republican) registrants and Non-partisan/third party registrants.

Tables 3-4 show that across education, age, and partisanship, the turnout penalty from ballot length is highest among groups that are plausibly least inclined to absorb additional political decision-making demands. These disparities are substantively large relative to observed turnout gaps between groups.

What types of elections reduce turnout?

Not all contests should have the same effect on turnout. The information costs of evaluating all contests are not uniform, nor are the perceived benefits of participating in all contests. A city council race, a county water district race, and a presidential election may therefore have very different effects on turnout when added to the ballot, though results from Tables 2-4 treat them equivalently. Consistent with this view, work in local politics has shown that the consolidation of local and federal races into on-cycle ballots has increased voter turnout for local races (Hajnal & Lewis, 2003; Lucero et al., 2024), indicating that the addition of federal and statewide contests increase voter turnout. Conversely, Phillips (2020) argues that when local elections move on-cycle, federal election turnout actually increases. Together, these findings suggest that the addition of some contests to the ballot may be mobilizing, while others may be demobilizing.

The previous section shows that the turnout penalty for ballot length is highest for those who are least well-positioned to bear the informational and decision-making costs of participation. I apply the same logic in this section to ask whether the turnout penalty for ballot length is also higher in contests where informational and decision-making costs are higher. This exercise is important for interpreting Table 2, as the pooled coefficient is identified from the existing distribution of contests that vary within cities or within counties (see Figure 1), rather than the full set of contests that can appear on the ballot.

To examine this possibility, I classify contests into categories, outlined in Appendix 1.1. I estimate whether certain types of contests are more strongly associated with turnout decline than others. While eleven categories are listed in Appendix Section 1.1, only some categories contribute meaningful identifying variation. The quantity of federal contests, statewide contests, statewide propositions, judicial seats, and law enforcement contests rarely differ within a given county or city, since these contests are typically either statewide or countywide (Figure 1). The results in Table 5 therefore consider contest types that actually differ across voters within the TWFE design.

Since Figure 1 shows that within-city variation in ballot length typically derives from

Table 5 – Special district and education-related elections lead to the most substantial decreases in voter turnout

	Prob Turnout (0-100%)	
	(1)	(2)
Council/Exec contests	0.204	0.148
	(0.049)	(0.033)
Education contests	−0.106	−0.249
	(0.034)	(0.025)
Special district contests	−0.742	−0.573
	(0.052)	(0.035)
Local direct dem contests	−0.047	−0.099
	(0.055)	(0.018)
Other city contests		0.171
		(0.059)
Geo-Time FE	City-year	County-year
Individual FE	X	X
N	12719910	14231726

Standard errors clustered by precinct-year and individual. Categories are described in Appendix Section 1.1.

city/county council districts, special districts, local direct democracy,[18] and education contests, I only consider these four contests in the within-city regressions in column 1. I add in other citywide contests (such as treasurer) in the within-county regressions in column 2, and the county-time specification in column 2 is also able to leverage additional variation from mayoral, at-large council contests,[19] and citywide direct democracy measures.

I find consistent results across both columns. Special district elections and education-related elections are consistently most responsible for lowered voter turnout. To interpret coefficients in Regression 1, an additional special district election depresses overall voter turnout by 0.73 percentage points and an additional education-related election depresses voter turnout by 0.1 percentage points. In column 2, the coefficient on local direct democracy

[18] In the categorization of contests, "local direct democracy" is the most nebulous, and does contain both measures for education and special districts as well as citywide measures. However, since special districts and education districts often encompass all or the majority of a city, I choose to only calculate these effects under the county-year FE specification. These measures are never for a section within a district (e.g. they never only apply to Fremont Unified School District, District 2, but rather the entire unified district).

[19] The California Voting Rights Act prompted many cities to switch to district-based council races, but citywide at-large council seats are still widely used in the state (https://roseinstitute.org/wp-content/uploads/2025/05/CA-City-Elections-Systems-Report_FINAL.pdf)

items (usually bonds) is also negative, and an extra contest tends to decrease turnout by 0.1 percentage points.

The effect on local direct democracy measures is small and imprecise in column 1, but doubles in size and is estimated with more precision in column 2 due to much more substantial variation in the quantity of these contests at the county level. Local direct democracy measures tend to reduce voter turnout, though at a much lower rate than special district or education contests. Having more city council or county council contests does not depress voter turnout — in fact, turnout increases when city/county executive and legislators are on the ballot under both specifications. As with the effects of ballot length on the oldest quintile of observations, this suggests that additional contests are not uniformly burdensome. High-salience contests can mobilize voters despite the added complexity to voting.

The congruence of these results and my theoretical framework hinges on special district, education, and local direct democracy contests being the types of contests where the cost of acquiring information and decision-making are particularly high. Certainly, these types of contests are for seats where elected officials have limited purview, where performance can be difficult to observe, and where the race itself tends to receive less media coverage. One way to determine whether these indeed are the types of races that voters struggle to make decisions on is to consider ballot roll-off.

In Figure 4, I show that the type of contests most likely to demobilize voters are the same types of contests that voters abstain from expressing a preference in, conditional on returning a ballot. In contrast to other data in this paper, roll-off is not observable at the individual level without cast vote records (and cast vote records are anonymous), and I cannot condition on the panel. I use ballot roll-off data from Santa Clara County in 2012, 2014, and 2022, by contest category. I use these out-of-sample years to show that these patterns are not artifacts of the specific elections used for identification. I define roll-off as the ratio of county-wide votes in a given contest relative to county-wide votes on the highest contest on the ballot (governor or president).

While rates of roll-off vary year-to-year, the ordering of roll-off by seat type is quite consistent throughout time, and voters regularly abstain from certain categories of contests.

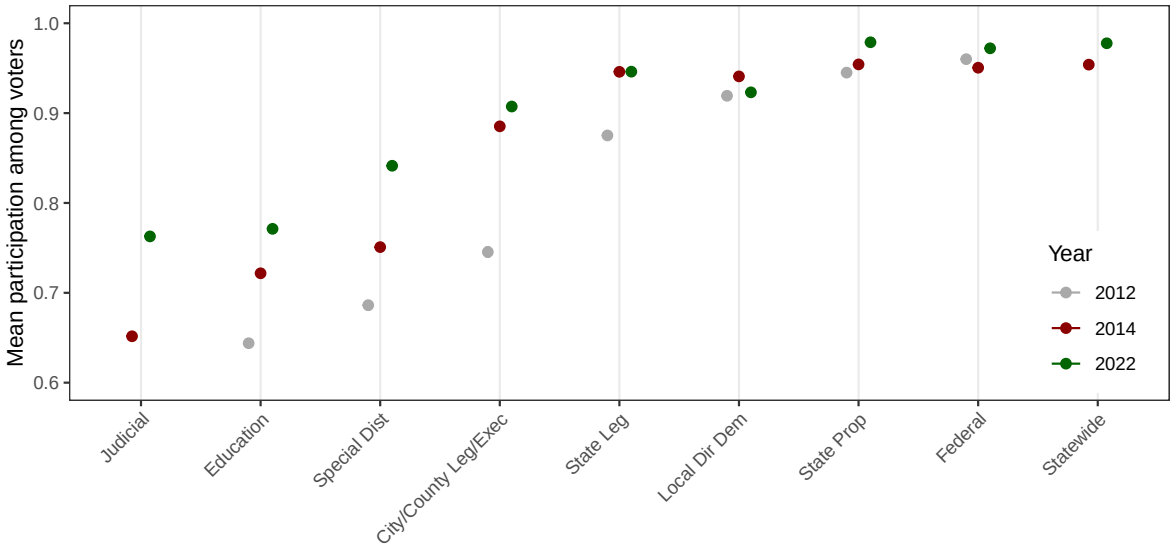

Figure 4 – Ballot roll-off by seat type in Santa Clara County 2012, 2014, and 2022 races (out-of-sample), where each precinct is an observation. Roll-off is relative to number of votes within the precinct for gubernatorial (2014 and 2022) or presidential (2012) races. Since top-ticket contest participation is the denominator, they are not used in calculating category averages.

Judicial contests also have very high levels of ballot roll-off but cannot be analyzed within this paper's difference-in-differences framework due to virtually no within-city and within-county variation.[20] While the roll-off on education and special district contests is high, local direct democracy measures have low roll-off, though its coefficient is also half the size of the coefficient on education in both specification *and* is easier.[21] Overall, these roll-off patterns broadly suggest that the contest types with the highest demobilizing effects are the same type of contests that voters struggle to make decisions on.

[20] A notable feature of California judicial elections is that they are retention elections, whereas all other elections are typically nominally competitive (uncontested seats typically do not appear on the ballot). A perception of a lack of true choice within a contest may also contribute to judicial roll-off.

[21] Unlike candidate contests, ballot measures offer a simple status quo heuristic as voters who are uncertain may simply vote no. Hessami and Resnjanskij (2019) uses Swiss data to show that no-voting becomes more common when the language surrounding these measures is more complex. This available heuristic may explain why roll-off for measures is low when they contribute to demobilization.

Discussion

Previous studies have shown that ballot complexity, defined by difficult contests as well as length, leads to mis-voting, reliance on heuristics, and abstention in down-ballot contests. In this paper, I consider the extensive margin in electoral participation and provide causal evidence that ballot complexity also deters individuals from returning a ballot.

To identify this effect, I use over 14 million observations of individual-level data from three election cycles in eight California counties. Using variation from the staggered nature of state and local elections and arbitrary district boundaries, I compare otherwise similar voters facing ballots of different lengths within the same city-year or county-year context. My results show that as ballot length increases, voter turnout declines, even after accounting for time-invariant individual characteristics and city-time or county-time characteristics. Specifically, I find that an additional five or six items on the ballot is associated with a 1 percentage point decrease in voter turnout. These turnout penalties are nontrivial over the range of ballot lengths commonly observed in Californian elections.

Heterogeneous effects are consistent with informational and decision-making demands play a central role in the turnout penalty. The penalty is higher for individuals who are younger, live in lower-educated areas, and who do not affiliate with the two major parties. These groups are typically less well-positioned to bear the informational and decision-making burdens of voting. The results found in these analyses are substantively significant, and at median ballot length, the penalty between those with the highest and lowest baselines to participate is equivalent to one-third to two-thirds of the overall turnout gaps between these groups.

The analysis on contest-type-specific effects further reinforces this interpretation. Not all items on the ballot are equally demobilizing. While an additional city or county council/executive contest increases turnout, on average, additional local direct democracy, education, and especially special district contests tend to decrease turnout. The demobilizing contest types are similar to the types of contests with the highest rates of ballot roll-off, suggesting that demobilizing contests are the ones that are often the hardest for ordinary

voters to evaluate.

Participation in democracy is a burden on citizens, and this paper demonstrates that variation in participation is not only shaped by registration rules and polling place access. The task of deciding who to vote for is embedded within the election itself and is a demand that deters participation across the citizenry. A government interested in maximizing voter turnout and minimizing inequality in voter turnout may consider changes to what contests are put on the ballot. For example, a turnout-maximizing government may make special district positions by-appointment, remove the mandate that tax increases be put up for a vote, or lengthen school board terms.[22] Of course, democratic institutions are not designed solely to maximize turnout, but my results show that ballot structure is a lever available to policymakers interested in maximizing turnout and decreasing participatory disparities.

Since this study uses data from California, who invests heavily in disseminating election material, a key unresolved question concerns whether these patterns hold if ballot length is more or less easily observed. While high information settings are ideal for helping all citizens navigate their choices, a failure to observe length until one is at the polling booth may mitigate the participatory penalty of longer ballots. On the other hand, easy observation removes uncertainty about which contests an individual is tasked with engaging in. Results in Appendix Table 13 consider California's 2020 switch to universal vote-by-mail elections (mail voting was previously only provided to those who requested it), which made the observation of ballot length easier. The results from Appendix Table 13 suggest that the penalty is less severe when vote-by-mail is in place, though these results cannot disentangle these effects from other 2020-era effects. More broadly, understanding how information environments shape the relationship between electoral burdens and participation is an important direction for future work.

These findings also point to a broader recurring tension in democratic reform. Longer ballots offer citizens the ability to control more aspects of the policymaking process, and remove power from elected officials. Expanding the ways citizens can express political preferences

[22]Placing local races in off-cycle ballots would potentially increase turnout in federal elections, but the overall effect on turnout is indeterminate as it has been shown that local contest turnout increases when the contests are on-cycle (Hajnal & Lewis, 2003).

in the democratic system through things like longer ballots, ranked choice voting, campaign finance vouchers, participatory budgeting, public meetings, or notice-and-comment rulemaking, means that individuals have more opportunities to shape elections and laws (Cormack, 2025; Doherty et al., 2024; Rossi & Stack, 2023; Yoder, 2020; Yorgason, 2025). However, these programs are all ask more of citizens' time and attention beyond casting a ballot, and successful participation is skewed towards high-voting propensity demographics. A key challenge for both researchers and practitioners is in investigating whether there are exceptions to this tradeoff, where heightened choice in the democratic system does not come at the expense of inequality in participation.

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1 Appendix

1.1 Categorization of races on ballots

I create eleven categories for races on ballots, detailed below.

1. Federal: Presidential and congressional races
2. State office: gubernatorial and other regular statewide offices, including board of equalization.
3. Propositions: statewide direct democracy contests. Contains both citizen-induced initiatives as well as bond, constitutional and legislative initiatives from the state legislature.
4. Judicial: Supreme, Appellate, and Superior justices retention elections.
5. Law enforcement: Races such as District Attorney and Sheriff. Does not include "police protection and community services" board members.
6. State legislature: California senate and assembly.
7. City and County councils or executives: includes city council, county councils (often called "supervisors"), and city and county executives.
8. Other city-wide office: City-wide non-legislative roles such as treasurer, auditor, and clerk
9. Special district: Districts for specific policy purposes. Often within a city or county, but this is not guaranteed. Special direct seats include positions on transit, parks, water supply, fire protection, irrigation, library, sanitation, health care, storm water, and community service boards. Does not include bonds/other policy question contests, which are grouped with local direct democracy.
10. Education: Includes school boards (including community college district boards), county board of education, and superintendent. Does not include bonds/other policy question contests, which are grouped with local direct democracy.

11. Local direct democracy: Non-statewide policy contests that citizens vote on. May be citizen initiatives or council/board policies that the law requires be voted on. Typically city-wide, but also includes contests (often bonds) at the school/special district level.

1.2 Turnout and the quantity of contests on the ballot

It is possible that the marginal effect of additional contests differs across the range of contests. In concrete terms, the reduction in voter turnout from 40 to 50 contests may differ from the reduction in voter turnout from 15 to 25 contests.

More practically, it is of interest to understand at what ballot length voter turnout decreases. States and municipalities govern the quantity (and types) of offices on the ballot and the regulations surrounding the qualification of direct democracy measures to the ballot. The democratic tradeoff in between the quantity of seats or policies decided directly through democratic means and voter turnout is normative in nature; however, it is particularly noteworthy if, at certain levels, additional contests are not accompanied by a reduction in voter turnout.

In this section, I analyze voter turnout across the observed support of ballot length. Within this data, no individual votes on fewer than 15 contests, and some individuals encountered 61 contests across the ballot. From my dataset, I sample 1,000,000 individuals.[23] The distribution of contests is plotted in gray on the bottom of the top panel in Figure 5. The line in the top panel of Figure 5 denotes mean voter turnout as the number of contests on the ballot varies. Some sporadic deviations aside (the most drastic deviations occur at rare values), this graph shows that ballot length and voter turnout are negatively correlated, even without the addition of any fixed effects. In general, individuals with longer ballots are less likely to return a ballot, but this pattern does not appear until about 33 contests on the ballot. Of course, this data is purely descriptive, and ballot length differs substantially between years and between counties.

The bottom panel implements the two-way fixed effect design, very similar to Equation 1, with a categorical instead of continuous independent variable. The middle panel considers

[23] The creation of a coefficient for each possible length is computationally intensive.

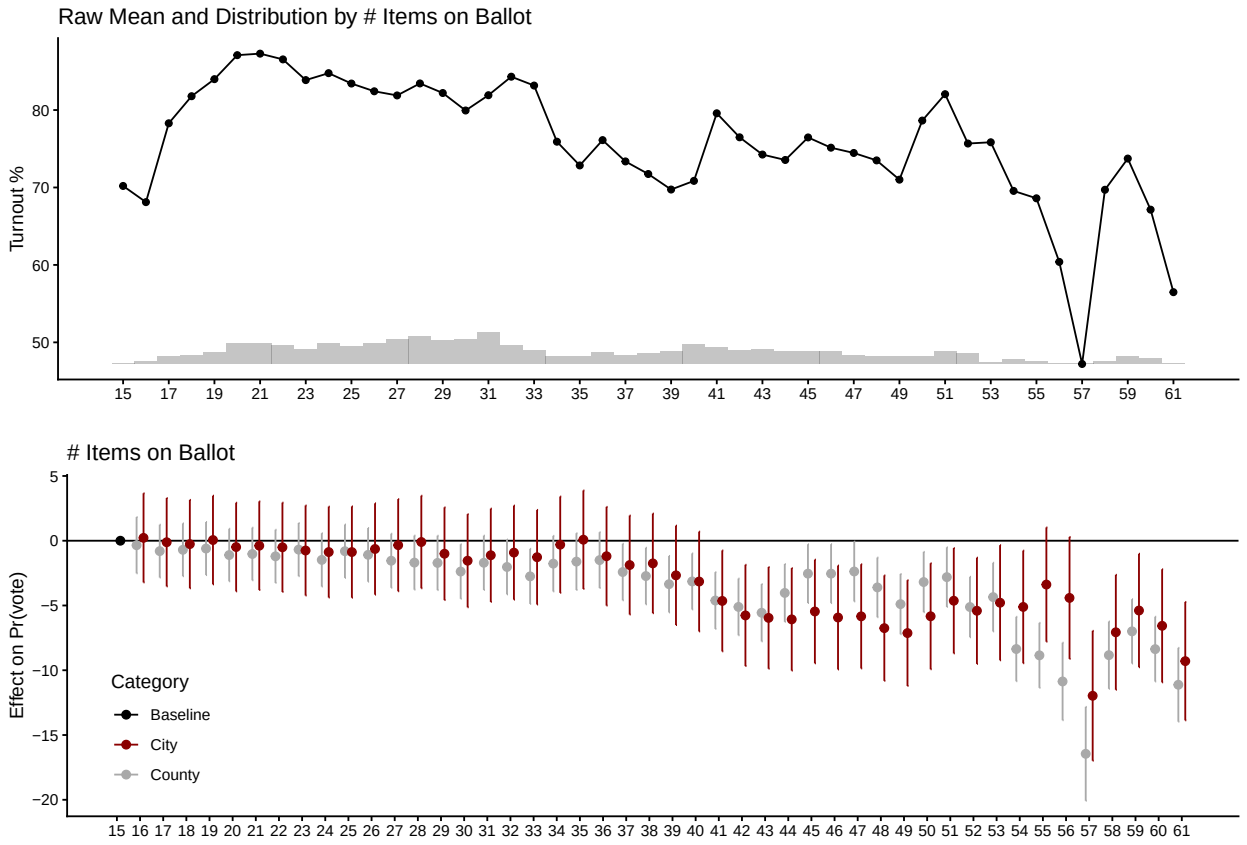

Figure 5 – Mean turnout by number of contests based on raw data (top panel), and the marginal effect of additional contests relative to the lowest baseline (bottom panel). Within both the descriptive and the design-based plots, voter turnout begins to substantially decrease when ballots are around 35 contests long.

the number of contests on the ballot, in comparison to a baseline of 15 contests on the ballot. In red are estimates from the city-year fixed effect design, and in gray, estimates from the county-year fixed effects design. Together, they converge on a common finding: relative to the baseline of 15, additional contests do not tend to reduce turnout until there are about 40 contests on the ballot, though a decline starting in the mid-30s is also present. It is important to note that this is an average across the whole population, and subgroup dynamics may differ.

The results in this section are likely a product of the type of contests on the ballot, the complexity of these contests, and mass interest in a given race. An important caveat is that these estimates are based on the distribution of races currently on the ballot in California:

it is highly likely that there exists some combination of numerous additional races, that if added to the ballot, do not have a demobilizing effect. Whether this pattern reflects a threshold in voters' willingness to bear decisional costs, the composition of contest types at different ballot lengths, or the distribution of identifying variation across the support is not possible to determine with this design (the histogram identifies variation, not necesssarily identifying variation). Conditional on this current distribution, the above analyses show that significant declines in voter turnout reliably appear by the high 30s and low 40s, given the current allocation of races on the ballot.

1.3 Restricting to non-movers

Of those living in a city (not unincorporated county), about 35% change cities within the period of study and about 65% remain within a single city. There are some possible concerns with movers. First, movers (within the eight counties) might be different than non-movers. I show below that subsetting to individuals who have persistently resided within the same city does not substantively change results.

Table 6 – Excluding individuals who move in between cities slightly reduces coefficients relative to the main text, but longer ballots persistently decrease voter turnout.

	Prob Turnout (0-100%)	
	(1)	(2)
Contests on ballot	−0.123	−0.170
	(0.027)	(0.015)
Geo-Time FE	City-year	County-year
Individual FE	X	X
N	8536396	8536396

Standard errors clustered by precinct-year and individual.

Consistent with the idea that this regression removes some of voters less prone to participation (it is well-understood that recent movers are less likely to vote), I recover smaller effects than those in Table 2. Nonetheless, even among this more-prone-to-voting sample, an additional 6-8 contests decrease turnout by 1% (pp).

Second, individuals living in areas with longer ballots might be more likely to move.

Given that residents of larger cities tend to receive longer ballots, and larger cities experience higher turnover in their population, and not all moves are perfectly observed by the California Secretary of State, it is theoretically plausible that effects are driven by high population churn in larger cities. I condition on voting in 2020 (and being registered in 2016-2018) and only use data from 2016-2018 in Table 7.

Table 7 – Excluding individuals who fail to vote in 2020 slightly increases coefficients relative to the main text, and longer ballots persistently decrease voter turnout.

	Prob Turnout (0-100%)	
	(1)	(2)
Contests on ballot	−0.211	−0.190
	(0.022)	(0.011)
Geo-Time FE	City-year	County-year
Individual FE	X	X
N	7130274	7987104

Standard errors clustered by precinct-year and individual.

Among this set of individuals with likely to be non-lapsed voters who indeed reside where they are registered (almost 87% of California voters did so by mail in 2020), effects are slightly larger but still nearby those presented in Table 2. Results from Table 7 indicate that results cannot be driven by an association in between individuals who both tend to get longer ballots (such as larger city residents) after moving and fail to vote after moving, but appear to be eligible voters within the voter file.

1.4 Placebo tests

I conduct two types of placebo tests. The first, Table 8, considers the lead of number of contests. If certain areas, which happened to be those that had more contests, were prone to lower levels of voter turnout, then we should expect that the coefficient on lead contests would be both negative and that the lead term would "crowd out" some of the effect on contests. Instead, I find that the lead terms are positive, not negative. While even small effect sizes are often statistically significant when n is very large, as in this design, the effect size is both directionally different from the main effect and about one quarter to one seventh

the magnitude. Effects are not driven by certain individuals living in particular precincts prone to longer ballots and lower voter turnout.

Table 8 – Results on placebo timing indicate that the lead of contests does not predict a drop in voter turnout. Effects on the lead are very small but statistically significant, likely partially due to the sample size as well as the cyclical nature of ballot length and 4-year term cycles.

	Probability Turnout (0-100%)			
	(1)	(2)	(3)	(4)
Contests on ballot			−0.116	−0.177
			(0.024)	(0.012)
Lead contests on ballot	0.021	0.035	0.019	0.024
	(0.003)	(0.003)	(0.003)	(0.003)
Geo-Time FE	City-year	County-year	City-year	County-year
Individual FE	X	X	X	X
N	8463318	9481672	8462732	9481056

Standard errors clustered by precinct-year and individual.

In Figure 6, I conduct a permutation test, effectively randomizing treatment level within a city-year. Using a sample of 150,000 individuals, I randomly reassign ballot length within city-year (from the city-year ballot length distribution) and run a regression (with individual and city-year fixed effects). I re-sample individuals and reassign ballot length within city 2000 times and report the results. The true effect is the red dotted line.

Under no iteration of the permutation test is the coefficient close to as extreme as the true coefficient. This indicates that effects are indeed driven by preceinct-level variation in ballot length, instead of generic city-time patterns. This guards against the possibility that statistical significance is purely the result of sample size and not randomization and verifies that city-year common shocks are not driving results.

1.5 Restricting the use of precincts that span multiple cities

This subsection addresses potential error arising from geocoding and from assuming that all precinct residents have the exact same contests. While these errors in treatment assignment would likely bias results toward zero, the results in Table 9, as well as the surrounding discussion, help quantify the extent of these potential issues.

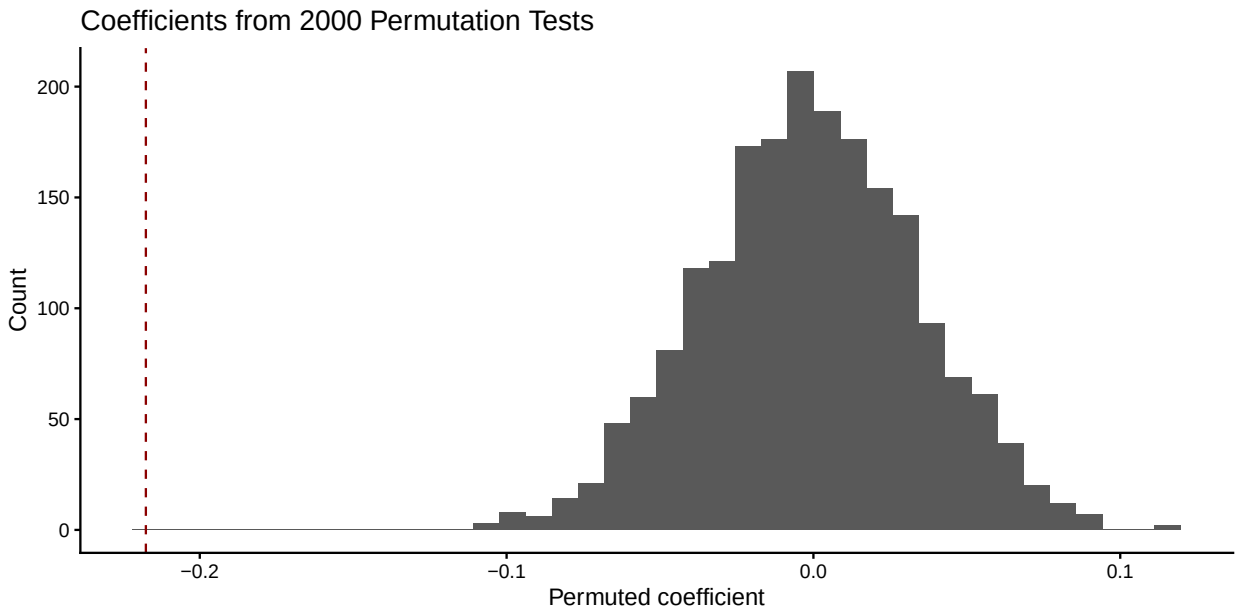

Figure 6 – In a city-year permutation test, no permutation iteration produces a coefficient as extreme as $\hat{\beta}$ (vertical red line).

City and county fixed effects are based on an individual's residential address. This residential address is geo-coded to obtain an individual's precinct, and sometimes address-based geocoding can be wrong. Within the data, some addresses are geocoded as being in a precinct in a neighboring city. Treatment is based on each individual's calculated precinct. While I cannot verify each address-precinct pairing, I can remove observations that are coded as being in a precinct-year predominantly comprised of observations from another city (columns 1 and 2) as well as entirely remove residents in precinct-years where the population is split into two or more cities (columns 3 and 4).

The results in Table 9 show that about three-quarters of precincts are recorded as being comprised entirely of a one city's residents, including being split into city-unincoporated county lines. About 96-97% of all individuals live within the majority-city within their precinct. In columns 1 and 2, where I only consider observations from the modal city each precinct-year, I find effects slightly larger than those in Table 2. Similarly, in columns 3 and 4, where I remove all precinct-years without total uniformity ins city of residence, I find even larger effects. There is no evidence that miscoded cities or precincts drive main text results. If anything, the effect of miscoding biases the results toward zero.

Table 9 – The removal of precincts that are coded as spanning multiple cities does not substantively change results.

	Prob Turnout (0-100%)			
	(1)	(2)	(3)	(4)
Contests on ballot	−0.208	−0.176	−0.233	−0.193
	(0.021)	(0.011)	(0.023)	(0.013)
Geo-Time FE	City-year	County-year	City-year	County-year
Individual FE	X	X	X	X
Remove likely wrong city	X	X		
Remove precincts with error			X	X
N	12331998	13767983	9011247	9914387

Standard errors clustered by precinct-year and individual.

1.6 Restricting the use of contests that may result in inaccurate precinct contest counts

Another treatment-assignment issue arises because precincts cannot always be drawn to perfectly align all contests among all residents, though as mentioned in the main text, all precinct members must at least be within the same city council district (as well as all higher-level districts). Columns 1 and 2 of Table 10 count only contests legally guaranteed to be contained within precinct lines, thereby dropping special district and education contests from the independent variable.

Columns 3 and 4 approach this potential issue from another angle. Consider a precinct that is split across two school board districts, which is legally allowable under California law. Assume both districts are holding elections, so in the Statement of Vote it appears as if voters within a given precinct are tasked with voting in both contests, when in reality individuals are voting in only one or the other. As a result, the independent variable is too high. To get around this, I assume that precincts that split districts have the highest count of special or education contests within a given city-year. I remove all observations where the highest count of special or education contests is equal to the city-year maximum. This necessarily reduces observations by nearly 90% in the county-year case (since this will necessarily remove many correctly-measured cases), but still provides enough data for the calculation of effects.

Table 10 – The removal of contests that are not legally guaranteed to be consistent within a precinct does not substantively change results.

	Prob Turnout (0-100%)			
	(1)	(2)	(3)	(4)
Guaranteed contests	−0.264	−0.153		
	(0.028)	(0.013)		
Contests on ballot			−0.465	−0.099
			(0.061)	(0.044)
Geo-Time FE	City-year	County-year	City-year	County-year
Individual FE	X	X	X	X
Remove Max School and Special			X	X
N	12719910	14231726	1600993	1600995

Standard errors clustered by precinct-year and individual.

In Table 10 columns 1 and 2, where I only use variation in the number of contests that are guaranteed to be stable within a precinct, I again find that results are substantively similar to those in the main text. The coefficients in columns 3 and 4, where I subset to observations without the maximum number of special district and education races (included observations must be neither), are somewhat larger and smaller, respectively, but are still statistically significant from zero. While I cannot perfectly measure ballot length within a precinct, errors arising from boundaries that encompass split special or educational districts do not drive results.

1.7 Reverse Causality

Low turnout in a given period could theoretically cause higher ballot length in the next period, particularly through special elections (including recalls and partial term seats) and local direct democracy measures (however, see Table 12 for results removing these types of elections). In this section, I consider whether reverse causality might drive the main text results.

Table 11 finds no evidence that low turnout in a period is associated with longer ballots in the next period. While the relationship is statistically significant (partially due to very large n), it is directionally inconsistent with a story of reverse causality, and the magnitude

Table 11 – Voting in time t predicts fewer than 0.1 *additional* contests in *t+1*. Areas with low electoral participation are not more likely to have longer ballots in the subsequent election.

	Number of contests in t+1	
	(1)	(2)
Voted (0/100)	0.00098	0.00085
	(0.00015)	(0.00014)
Geo-Time FE	City-year	County-year
Individual FE	X	X
N	8463318	9481656

Standard errors clustered by precinct-year and individual.

is very small: a voter and a non-voter are expected to differ by fewer than 0.1 contests on the ballot. Because each observation must also contain information about t+1, there are about two thirds the number of observations as in main text results, since the period of study if over three election cycles.

1.8 Non-regularly scheduled elections

In this section, I consider whether non-regular elections could be driving results. Ballot length is mostly determined by timing and district boundaries, but ballots may also become longer due to the addition of non-cyclical elections on the ballot. These may be in the form of recall elections, elections to fill unexpired terms (including those that were unexpired because of a prior recall), and local measures (which may be submitted by citizens). It is possible that the forces that cause ballots to become long are the same forces that depress voter turnout. For example, intense activity from a niche special interest group could result in additional contests being placed on the ballot, but widespread disinterest among the general public, who view the election as a litigation over an issue they do not care to learn about.

In Table 12, I do not find cause for concern. I use three different specifications to examine how these irregular contests affect voter turnout. In columns 1 and 2, I subtract the number of recall and unexpired term contests from the ballot. The vast majority of contests are regularly scheduled. In columns 3 and 4, I restrict analysis to ballots without any irregular

Table 12 – The removal of non-regular elections, such as recalls and elections for partial terms, do not substantially change results. Column 1 and 2 remove partial term and recall elections. Column 3 and 4 consider only elections without any recalls and partial term contests on the ballot. Columns 5 and 6 also remove all local direct democracy contests and finds similar results.

	Probability Turnout (0-100%)					
	(1)	(2)	(3)	(4)	(5)	(6)
Non-special contests	−0.192	−0.169				
	(0.020)	(0.011)				
Ballot contests			−0.203	−0.181		
			(0.021)	(0.011)		
Non-spec + LDD					−0.247	−0.256
					(0.022)	(0.017)
Data	Full	Full	No Spec Elec	No Spec Elec	Full	Full
Geo-Time FE	City-year	County-year	City-year	County-year	City-year	County-year
Individual FE	X	X	X	X	X	X
N	12719910	14231726	11730719	13154750	12719910	14231726

Standard errors clustered by precinct-year and individual. LDD = local direct democracy, including city, school, and special district measures and initiatives.

contests: over 90% of ballots have no irregular contests. In columns 5 and 6, I also remove local direct democracy measures. Not all local measures derive from the citizen petitions: in many cases, local governments must use a measure to raise taxes. Of course, citizen pressure may lead to tax-raising measures. Under all cases, I find that results are robust to the exclusion of irregular contests. Results are not driven by the inclusion of irregular contests.

1.9 Do effects persist under mail voting?

Does the penalty for long ballots persist when all individuals are guaranteed ample time to spend filling out their ballot? The case of mail voting provides competing expectations on the penalty for complex ballots. On one hand, having the ability to fill out one's ballot at home may reduce the penalty for complexity, as prospective voters may be able to research, select preferred candidates, and fill out the ballot at their own pace. On the other hand, California residents had ample opportunities to observe ballot length, research, and select preferred candidates prior to universal mail voting thanks to universally distributed voter

guides and sample ballots, as well as an already-existing opt-in mail voting program. In essence, the key difference is time with the actual ballot itself, for individuals not enrolled in permanent mail voting, and it is possible that individuals behave differently with the actual ballot itself than with educational materials.

In 2016, mail ballots were distributed only to those who requested to vote by mail, but individuals were able to request permanent mail voting status. In 2016, over half of voters returned a mail ballot.[24] In 2018, San Mateo County piloted an all-mail voting program (though in-person voting remained an option), but all other counties within this study continued with opt-in mail voting. Additional counties had intended to join the pilot for the 2020 election, but statewide mail voting was implemented due to the coronavirus pandemic. In this section, I compare the penalty for ballot length when universal vote by mail is and is not in place.

In both columns 1 and 2 of Table 13, the turnout penalty for ballot length is higher in the absence of mail voting, and the slopes on number of contests are statistically distinct. The penalty on ballot length is negative and statistically significant in both the presence and absence of universal mail voting. Without mail voting, each four to six contests result in a 1% (pp) decrease in voter turnout. Even under mail voting, an additional seven or eight contests leads to a 1% (pp) reduction in overall voter turnout.

Table 13 – A penalty for ballot length persists in both universal mail voting and opt-in-only mail voting periods, though the penalty is larger in the absence of universal mail voting.

	Prob Turnout (0-100%)	
	(1)	(2)
Contests x No universal VBM	−0.217	−0.184
	(0.023)	(0.011)
Contests x Universal VBM	−0.152	−0.114
	(0.033)	(0.019)
Geo-Time FE	City-year	County-year
Individual FE	X	X
N	12719910	14231726

Standard errors clustered by precinct-year and individual.

[24] https://www.sos.ca.gov/elections/historical-absentee

As with Tables 3-4 from the main text, these results should not be interpreted as the causal effect of vote-by-mail on the ballot length on turnout relationship since mail voting is not randomly assigned. Vote-by-mail is nearly collinear with year (except in the case of San Mateo county), with all-county adoption in 2020 and no countywide adoption in 2016. As in Tables 3-4, it is possible that factors that are correlated with the timing of mail-voting adoption could be responsible for the differences in β as mail voting status varies. For example, universal statewide mail voting was put in place in a presidential year where the California senator is on the ballot for vice president, and this contest could plausibly encourage marginal prospective voters to vote. Instead, the primary takeaway is that even in elections where the top of the ticket is generally appealing to Californians and when all Californians had ample time to fill out their ballot at home, longer ballots continued to dissuade prospective voters from voting.